A CHILTON PUBLICATION

the Iron Age

THE NATIONAL METALWORKING WEEKLY

April 2, 1953

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APR 2 1953

EAST ENGINEERING

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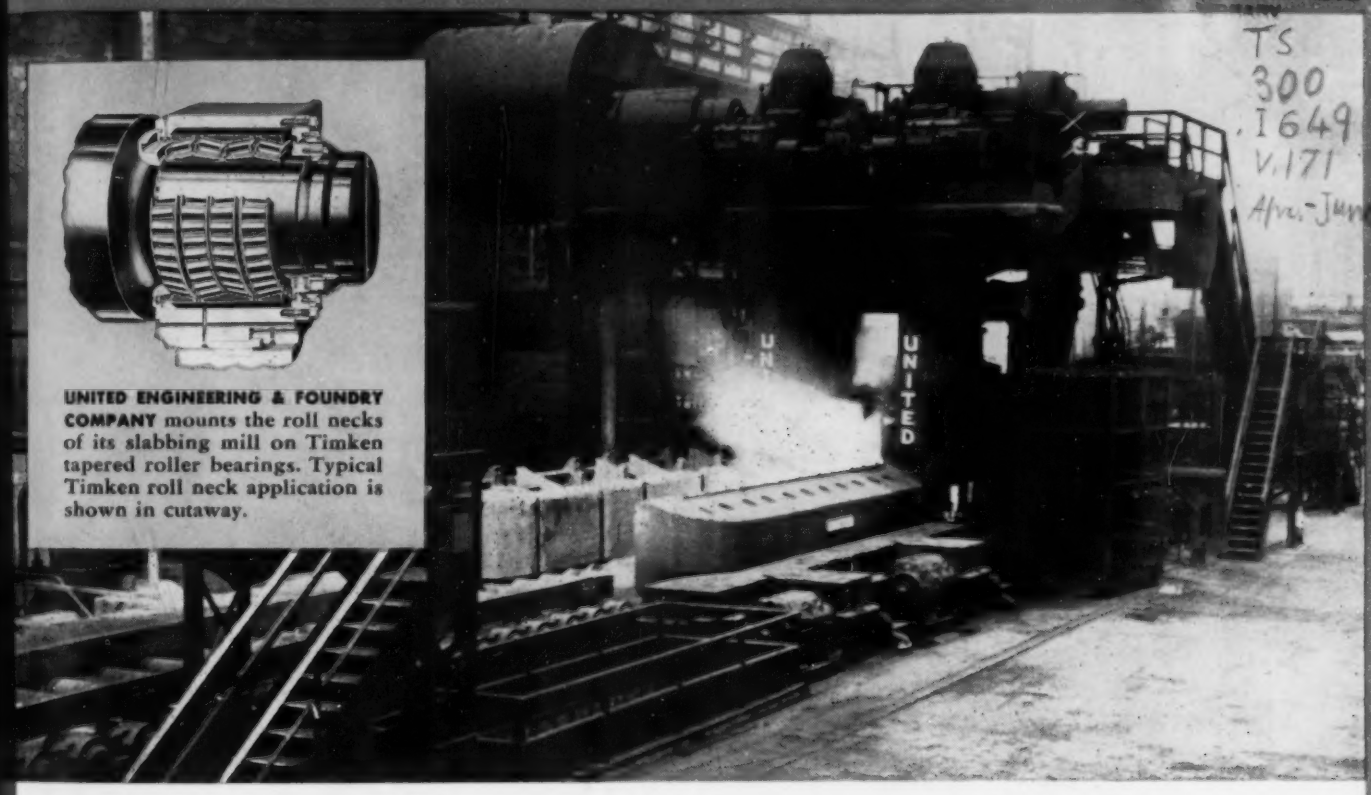


UNITED ENGINEERING & FOUNDRY COMPANY mounts the roll necks of its slabbing mill on Timken tapered roller bearings. Typical Timken roll neck application is shown in cutaway.

Holds world's record of 214,842 tons in 31 days . . . *with help of TIMKEN® bearings*

THIS United Engineering slabbing mill recently set a world's record at U. S. Steel's Homestead plant by producing 214,842 net tons of steel slabs in 31 days. Timken bearings on the roll necks helped reduce time-outs for repair and maintenance to a minimum, insured long, trouble-free performance.

The balanced proportion design of Timken bearings provides maximum bearing capacity in a given space. Load ratings are increased up to 40%, roll neck strength 50 to 60%.

Timken tapered roller bearings give you greater mill rigidity, permit larger diameter roll necks. Costly and complicated lubrication systems are eliminated.

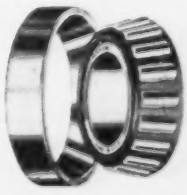
And because they take radial and thrust loads in any combination, no special thrust bearings are needed.

Years of research and development by The Timken Company have resulted in many improvements in roll neck bearing design and performance. For further information, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



Never Before!!

...SO MUCH POWER PER POUND

MEET the new Rotor Vertical Air Grinders! Never before have you had so much power in vertical air grinders...for such light weight! They're well balanced . . . easy on the operator. Here are *new* features to speed up your metal removal.

THE NEW B-35

Weight	10¾ lbs.
Height	7½ inches
Spindle	⅝" - 11"

6000 - 5500 - 4500 - 3500 RPM

THE NEW B-12

Weight	10 lbs.
Height	7 inches
Spindle	⅝" - 11"

6000 - 5500 - 4500 - 3500 RPM

For cup wheels, sanding pads, cut-off wheels, wire brushing.

AIR O'TOOL

WRITE TODAY FOR BULLETIN No. 40.

THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

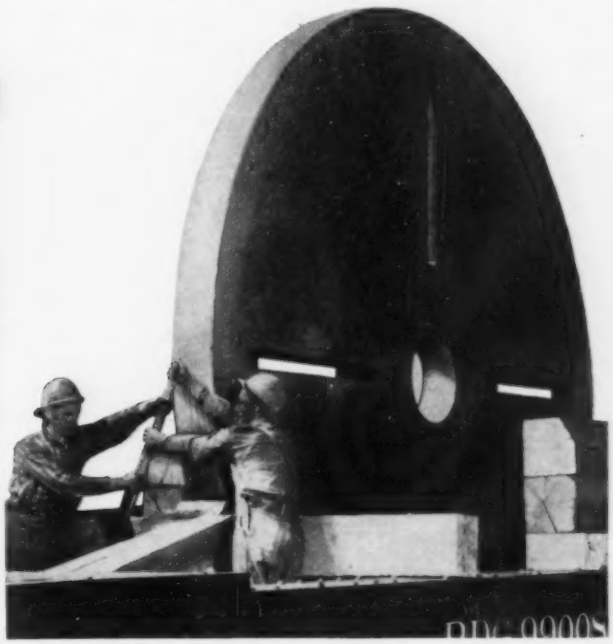
Engin.
Wahr

Here are some Bethlehem forgings with three things in common: they are very large, very flat, and very round. From that point on, if you consider their uses, they are not even distant cousins.

That whopper on the truck weighs 48 tons. It is one of eleven discs for a big compressor to be installed in a wind tunnel. The slotted forging standing in the freight car is a chipper disc used in wood-pulping; weight, 35 tons. Somewhat dwarfed by comparison are the two forged tube sheets, above, which tip the beam at a mere 12 tons apiece.

You might think from this that we're especially partial to circular pieces. Actually, we like to get our teeth into almost every kind of forging, regardless of shape or size. At times there are orders that call for some pretty ingenious ways and means, and these our shops are equipped to handle as capably as the simpler types.

The forgings you need may not be round like the ones shown here. But whatever your designs, they can be made at Bethlehem and made the way you want them. Whenever we can be of service, call or write us.



BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Bethlehem FORGINGS

The Iron Age

Vol. 171, No. 14, April 2, 1953

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Address mail to 100 E. 42 St., N. Y. 17, N. Y.

DIGEST of

NEWS DEVELOPMENTS

CURE IN SIGHT FOR SICKLY COAL INDUSTRY — P. 92
Bituminous coal medicine men are sure they can cure their ailing industry. But they don't expect to do it overnight. They are leaning heavily on research and expected rises in the use of electric energy. Future depletion of oil and gas supply will also help. Coal pipelines are proving successful, too.

STEAM'S UP FOR GREAT LAKES ORE SHIPPING—P. 93
As the 1953 iron ore shipping season started, over half of the Great Lakes fleet moved northward. With good steel output seen continuing, shippers see 1953 as the big year. They expect to haul about 100 million gross tons. No one will predict more. Ore stockpiles are considered high, scrap's comfortable.

GOOD HOUSEKEEPING PAYS MANY DIVIDENDS — P. 96
Bethlehem Steel finds company-wide policy is rewarded with high production and efficiency, shorter downtime, and less cost and lost time from accidents. Company has rolled up impressive record in safety. Specific examples in plants show how policy of good housekeeping benefits the whole company.

STUDY IMPROVED OUTPUT, QUALITY, COSTS — P. 100
Basic theme of last week's SAE meeting in Cleveland was betterment of production, quality and reduction of costs. Shell molding seems to have lost the center of the stage. Trends noted were radio-equipped fork lift trucks and tendency to evaluate suppliers in terms of their quality control.

HOT STUFF SOLVES AUTO ENGINE SECRETS — P. 106
Ford's radioactive isotope lab is proving valuable in finding out just what happens inside automobile engines. Radioactive tracers are giving engineers essential data on basic problems such as piston ring wear and rotation, airflow, and oil use. Many of these tests were impossible with conventional methods.

RAILS READY TO BUY MAINTENANCE STEEL — P. 111
Interstate Commerce Commission estimates railroads have $1 billion worth of postponed maintenance work. It should mean heavier buying of steel rail and other track items. Total dollar value of needed steel rail is estimated at $200,851,000 and for other iron and steel track materials, $219,295,000.

the Week in Metalworking

ENGINEERING & PRODUCTION

USE IMPACT FORGING ON DIFFICULT PARTS—P. 149
Aluminum shapes hard to form by other methods are easily made by impact forging. Faster production, less waste and greater economy in machining time and labor are possible. Forgings have been made in 2S, 52S, 61S and 14S alloys. Method pays off when odd shapes make machining costly.

VACUUM-MELTED 52100 GIVES EXTRA LIFE — P. 154
Better fatigue life and improved impact properties have been found in samples of vacuum-melted 52100 compared with commercial 52100 steel. Extra metal cleanness possible with the vacuum melting method is an important factor in improved metal properties. Production melts of 600 lb in steel are possible.

BETTER CHIP HANDLING IN AND OUT OF PLANT—P. 157
Chip handling facilities were given plenty of attention in planning the Buick's new V-8 engine plant. Conveyers, including some below floor, handle chips from gray-iron castings. Steel chips are crushed and blown into storage bins by a pneumatic system. Overhead bins dump scrap into railway cars.

MAKE ELECTRIC WELDING OPERATIONS SAFER—P. 160
Lost time can be cut and morale improved by use of proper safety equipment and simple safety practices to cut health hazards incident to electric welding. Eyes can be protected from painful eye flash with proper helmets and goggles. Respiratory irritations can be cut with proper exhaust equipment.

TITANIUM, STEEL HEAT TREATING COMPARED—P. 162
Titanium cannot be quench-hardened like steel because the crystalline structures are reversed. Age hardening can be used on alloys of unstable beta phase but high temperature properties suffer. Alpha-beta Ti alloys should be used in the fully stabilized condition.

NEXT WEEK—USE GRAY IRONS FOR VOLUME OUTPUT
Tool-life tests show machinability of high-phosphorous gray irons compares favorably with low-phosphorous irons. Steadite has no adverse effect on machinability. Nickel in alloyed irons helps machining properties. Carbide stabilizing effect of chromium sharply reduces tool life.

MARKETS & PRICES

AIR CONDITIONERS PLAN FOR HOT MARKET — P. 89
Air conditioner manufacturers are expecting demand for their products to be the hottest thing this summer. Newcomers are getting into the act, and established firms are expanding facilities. Greatest emphasis is being placed on window models, but market for complete year-round house units is growing.

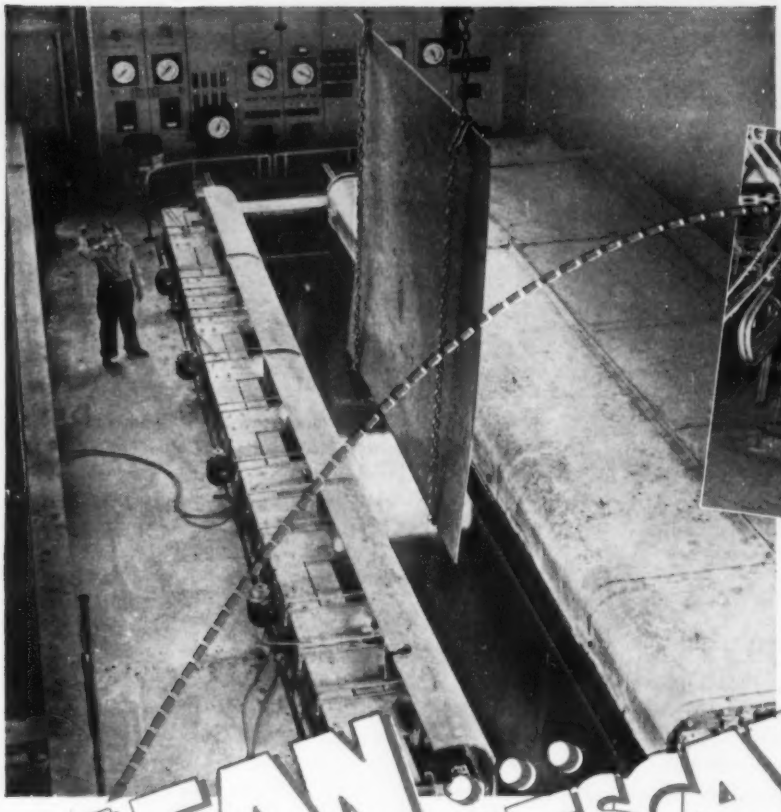
AUTO SALES SET STAMPERS' SHEET SUPPLY — P. 95
Stampers are looking at soaring ingot rates and asking, "Why can't we get all the sheets we need without conversion?" Availability of sheet steel for stamping and secondary operations will depend on automotive sales in the second half. If they remain high, sheet will be tight longer than expected.

ARE FARM MACHINERY SALES DRYING UP? — P. 101
For many farm machinery dealers the traditional spring buying surge is arriving sporadically or late this year. Distributors are carrying heavy inventories and some large producers have cut production 10 pct since the year began. Blame is laid to tighter credit, drop in farm prices and last year's drought.

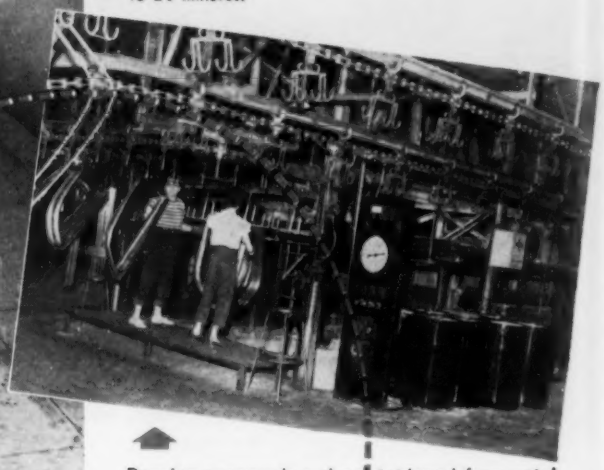
FOURTH INCREASE IN NEW TOOL ORDERS — P. 117
Demand from civilian buyers raised February new order index to 282.2, marking fourth consecutive month in which new orders have risen. Cancellation rate and shipments both decline. But some builders still doubt firmness of the tool market and stick by predictions that business will drop later this year.

STEEL PRODUCTION REACHES NEW HIGH MARK—P. 191
For the first time in history the steel industry has produced more than 10 million tons of steel in a single month. But if consumer demand continues (as expected) still higher production may be expected—even though March is usually a high point in output. Third quarter books are filling fast.

USERS STILL WAIT COPPER CLARIFICATION—P. 194
A month has passed since copper ceilings ended and still the confusion persists. Prices now range from 27.50¢ to 34.50¢ for domestic metal, and up to 36.50¢ for foreign. Buyers went into a scramble for cheaper copper when allocations were distributed. Some will have to buy 36.50¢ Chilean copper.



Stainless, carbon, alloy and high-speed tool steels and non-ferrous alloys descaled in from 15 seconds to 20 minutes.



Drawing compounds and paint stripped from metal stampings in 50 seconds.

CLEAN... DESCALE... DESAND

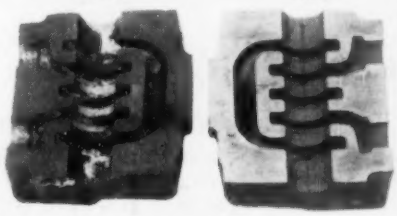
...faster, better at appreciably less cost

From removing metallic oxide scale from huge plates, coils or bars to desanding molds or cleaning residual materials from stampings, the Ajax Electric Salt Bath Furnace paves the way to appreciable savings in labor, floor space and time. What's more, the work is done far more efficiently than is possible with sandblasting, acid pickling, electrolytic anodic cleaning or other methods.

The Ajax Salt Bath Furnace is adaptable to many metal and alloy types. Different metals and different metal shapes can be descaled simultaneously. The bath acts uniformly on all parts of the work including blind holes. The process reacts only on scale, sand or residual materials. The base metal is not affected and there is no hydrogen embrittlement. First cost of the equipment is low and so is upkeep. Pot and electrode life is measured in years and the bath can be regenerated indefinitely by the addition of low cost chemicals. Where desired, the entire process can be mechanized for highly efficient mass production.

Write today, giving details of your finishing problem. Let Ajax engineers prove these claims—at not the slightest obligation. Reprinted technical articles on cleaning, descaling and desanding are available on request.

Grease, drawing compounds, residual rubber, carbon black, plastics, paint and enamel removed in minutes with less labor.



Residual sand removed from these pump casings by 3-minute salt bath immersion at 700°F.

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WORLD'S LARGEST MANUFACTURER OF ELECTRIC HEAT TREATING FURNACES EXCLUSIVELY

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THE IRON AGE

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What's Ahead For You

ARE you one of those fellows who fear a sharp downturn in business this year? Are you holding up an expansion program—waiting for the "right time" or lower prices?

Do you get the shivers inside when such words as: "the thirties," depression, recession are mentioned? Have you a good idea for a new product which you have tabled for the time being?

Have you lost faith in your sales ability? The future of your country? Your company? Do you think there are no bigger horizons?

If your answer is "yes" to most of these questions, take heart. It is extremely unlikely that our country will go to the dogs this year—or ever. Here are a few simple signposts to look for in 1953:

Normal production and consumption trends are showing up—spring sales, summer hesitation and fall pickup. Sharpen up your sales force, ring doorbells and sell your customers.

Malenkov is a big question mark. He is capable of making catastrophic international blunders. Our defense people know this. There will be no paring down on defense equipment or military security. There may be a quiet stepup.

The Korean War cannot remain a stalemate. We won't pull out and we can't continue past experience. Current "peace" propaganda from Russia is recognized for what it is—communistic hogwash.

Steel and other metal inventories are not high—in most cases they are low compared with the rate of manufacturing. It will take some time to build these inventories to a higher level.

Consumer buying is being sustained and will go even higher before summer. Sales of autos, appliances, furniture and homes directly affect sales of producers' goods, machinery and plant expansion.

Steel prices are going up—so are steel wages. That looks like the seventh round in a basic industry. Both wage and price increases will be moderate.

The time to expand is now—if you have a good product, good potential and a strong belief in the future of your company. Let the other fellow worry about tough times ahead. Take advantage of today's opportunities.

Strengthen your sales and research programs and figure out how you can grow, grow with the country and its people. In that way you will be strong enough to meet any problem—when it comes.

Tom Campbell

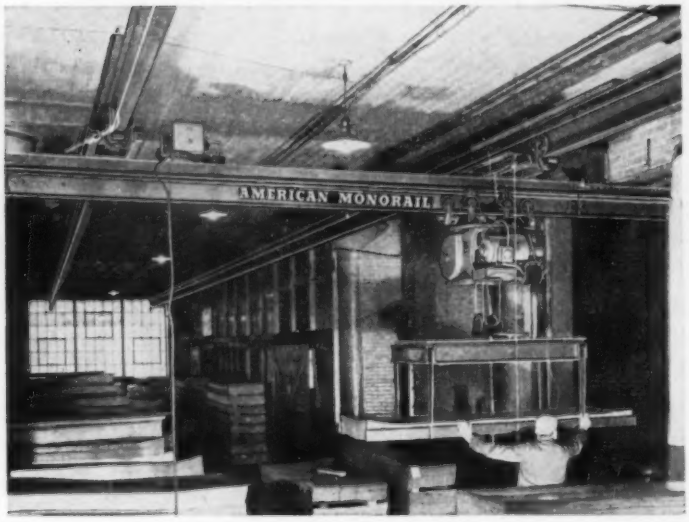
Editor

AMERICAN MONORAIL

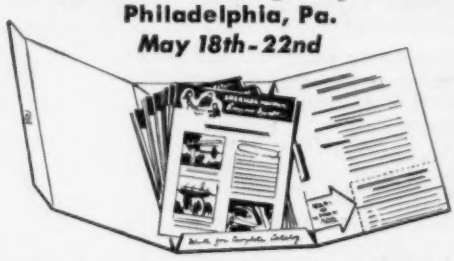
- **INCREASES PLANT CAPACITY AND PRODUCTION**
- **REDUCES HANDLING COSTS, DAMAGE AND LOSS**

American MonoRail Engineers can show you how to get more profitable production out of your plant by systematizing material handling. Let them show you how to convert lost ceiling space to profit—how to eliminate obstructive storage around machines—lessen worker fatigue—reduce heavy load accidents—stop damage to product in motion.

Bring us your handling problems —American MonoRail can provide the equipment best suited to your needs.



See our booth at the
5th National
Materials Handling Exposition
Philadelphia, Pa.
May 18th - 22nd



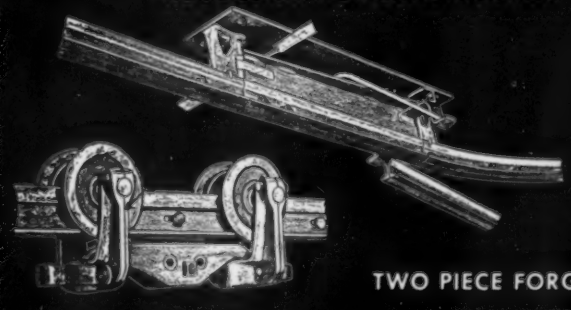
Send for New Case Study File

This brand new case study file contains the first of a continuing series of case studies covering many successful American MonoRail installations. Send today for original file. Future studies will reach you as published.

THE AMERICAN MONORAIL COMPANY

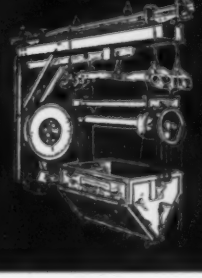
13103 ATHENS AVENUE CLEVELAND 7, OHIO

RUGGED SWITCH CONSTRUCTION

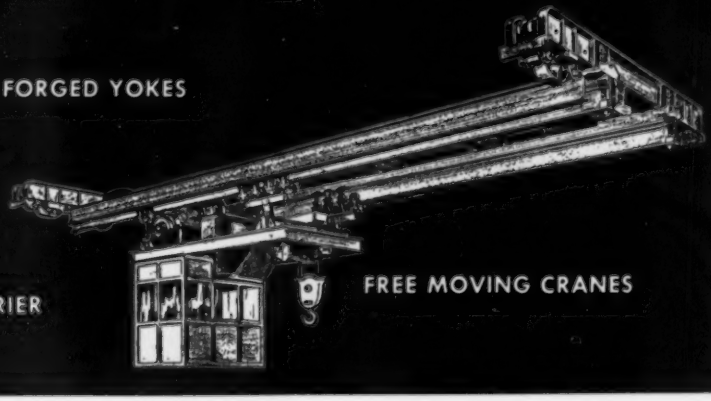


OVERLAPPING SPLICE

TWO PIECE FORGED YOKES



SCALE HOIST CARRIER



FREE MOVING CRANES

Dear Editor:

Letters from readers

Through The Years

Sir:

I have been a reader of THE IRON AGE since I first entered the employ of the Illinois Steel Co. at Joliet, Ill. in 1908. I served the company for 43 years and am now retired . . .

As a retired man, I want to compliment you on the editorial appearing in your Nov. 8, 1951 issue entitled "Call Them Back" and the editorial in the Sept. 11, 1952 issue entitled "The Older Worker." I have heard many people comment favorably on these two editorials. They certainly hit the nail on the head and more should be done about it, especially now that geriatrics has become so important in our American life.

J. V. FREEMAN
Consultant
Coal & Coal Chemicals
New York

For All To See

Sir:

I would like very much to have copies of the editorial which appeared in the Feb. 26 issue, "How To Start A Depression" by Tom Campbell.

How many can you spare? Everybody should see this!

M. HOLTMAN
Librarian
P. R. Mallory & Co., Inc.
Indianapolis

V-P in Charge of Souls

Sir:

For the past 4 years I have been happily reading your editorials in THE IRON AGE with considerable profit. I have quoted you several times in messages I have delivered.

Your editorial "Vice-President in Charge of Souls" especially appealed to me. I felt that a chaplain in industry might be able to accomplish much, particularly in an office of several hundred employees. A spiritual counsellor might be able to "smooth over" and assist many workers and working conditions in this industrial age. . . .

L. R. BROWN
Minister
United Presbyterian Church
Struthers, Ohio

Food for Thought

Sir:

May we have permission to reprint in our company publication, Pipe Dreams, the editorial "Food for Thought" from the Dec. 25 issue?

M. PUCHIR
Editor, Pipe Dreams
Universal Concrete Pipe Co.
Columbus, Ohio

Testing Lubricants

Sir:

We were interested to note the item on p. 51 of your Feb. 19 issue regarding high temperature synthetic lubricating compounds. Can you tell us where we can obtain further information on these compounds and if there are commercial sources of supply at present.

J. M. SCHUCKERS
Chief Engineer, Clutch Div.
Hilliard Corp.
Elmira, N. Y.

The compounds are being studied at the Lewis Flight Propulsion Laboratory, Cleveland, Ohio. Contact Dr. Edward R. Sharp, director, for more details.—Ed.

Plating Barrels

Sir:

On p. 98 of your Jan. 22 issue there was a brief description of a barrel type plating unit which is used in existing still tanks by the simple expedient of moving it from tank to tank and plugging it into a 110-v receptacle. We do not find the manufacturer of this unit listed and would appreciate your furnishing us with the name and address.

C. T. BURGE
Director of Purchases
Sterling Faucet Co.
Morgantown, W. Va.

The manufacturers, whose barrels we described in our article, are Harwood Line Mfg. Co., 2022 N. California Ave., Chicago, Ill., and Hanson-Van Winkle-Munning Co., Matawan, N. J.—Ed.

Properzi Casting

Sir:

In the Feb. 22 issue, on p. 73, there is illustrated a continuous rolling mill for rolling Properzi continuous cast aluminum. This equipment is supposedly of Italian design and we would appreciate having you advise us the name of this machine and the address where it is sold.

H. S. FREYNIK
Vice-President
Riverside Metal Co.
Riverside, N. J.

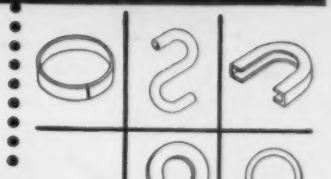
The American rights to the Properzi continuous casting machine was granted to the Nichols Wire & Aluminum Co., 1725 Rockingham St., Davenport, Ohio.—Ed.

Forming Titanium

Sir:

Would you kindly send me tear sheets of the article "Titanium Can Be Deep Drawn" which appeared on p. 136 of your Feb. 12 issue.

J. A. PERRY
Physical Metallurgy Div.
Dept. of Mines & Technical Surveys
Ottawa, Ont.



Bend a Variety of Materials

Accurately, Easily, Quickly with a DI-ACRO* BENDER

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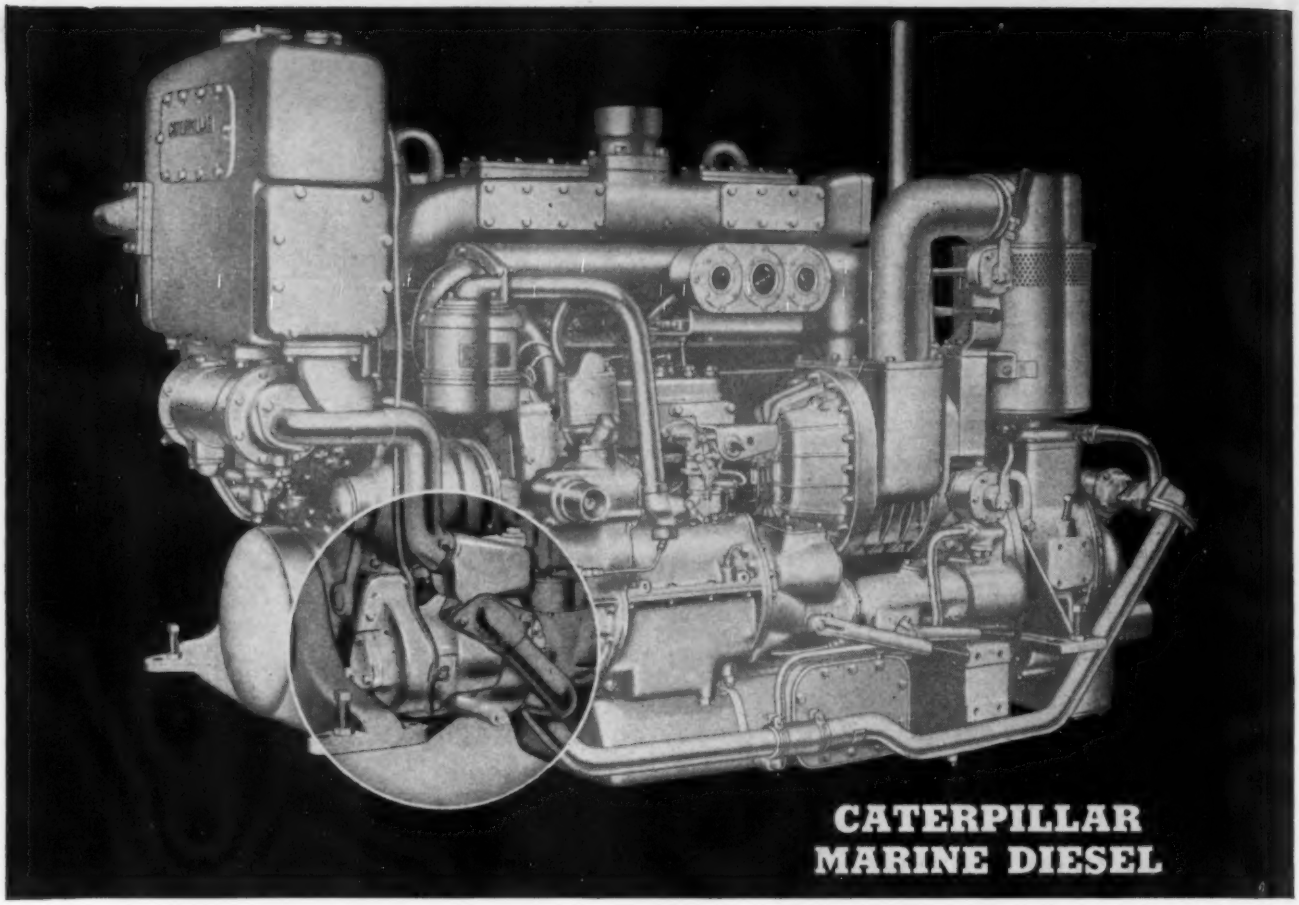

National Bearing Castings Help Cool "Cat" Engines

National Bearing Division's foundry skill permitted a new design in pump efficiency and compactness.

This extremely compact 170 horsepower Marine Diesel Engine, with special coolant pump, is a new design in efficiency by Caterpillar Tractor Co., Peoria, Illinois, makers of famous "Caterpillar" Diesel Engines, Tractors, Motor Graders, and Earthmoving Equipment.

Unusual size restrictions were specified in the coolant pump housing. It had to be of tough, durable bronze, highly resistant to corrosion by raw sea water, and painstakingly cast as the housing component for a very compact coolant pump, capable of delivering 100 gallons per minute. The housing casting design was unusually intricate, with wall thicknesses exactly ¼" in some areas, 5/32" in others. The mold for each casting required *14 cores*—all perfectly positioned, as the slightest misalignment would be ruinous. And, housings had to be cast to minimize machining.

"Caterpillar" selected National Bearing Division to provide these special bronze pump housings. We were chosen for proven ability to produce top quality castings, our unique core facilities, and our experience in applying over 50 years of specialization to customers' problems.

Our bronze pump housing castings met—and continue to meet — "Caterpillar's" specifications for quality, tolerance, and minimum machining in every respect.

If your product includes copper, bronze, or other copper-base castings, it will be worth your while to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

Write to National Bearing Division for complete information and your copy of our catalog.

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Fatigue Cracks

by William M. Coffey

Now Cut That Out!

We like Chief Bosun's Mates, little boys that like to fish, Bock beer, Irish setters, the Infantry, Friendship sloops and Marilyn Monroe calendars—things like that. Also news reporting that comes fairly close to the straight goods.

That's why we were just a little concerned when a very able contemporary of ours, a younger cousin in the great publishing fraternity, made one claim too many for another esteemed, admired and friendly friend of the great publishing fraternity.

Few magazines have been around as long as THE IRON AGE, your favorite family journal. It's been 98 years and something like 5000 weekly issues that we've turned out in servicing the largest of America's industries, the metalworking industry — which, of course, means darn near one out of every two working Americans, male gender. And some of the other gender, too.

With that kind of experience we feel compelled to tell *Time* Magazine that its story about *Business Week* in the March 23rd issue needs a little adjusting. Not up to their usually superb accuracy.

***Time* said "last year *Business Week* ran more ads than any other magazine in the world (5502 pages) . . ." If we could shoot straight there would be another dead one for Boot Hill. *Industrial Marketing* magazine shows that last year THE IRON AGE (7335 pages) ran more ads than any other magazine in the world, second only to our greatly esteemed, admired and friendly friend, *The Oil and Gas Journal* (7626 pages). *Business Week* was fifth. We might add, too, that your ffj has topped all magazines of all kinds in the world in every year (except three) that advertising volume records have been kept. And watch this year.**

So, for the benefit of our *best* friends we say, "Don't believe it. You still subscribe to the Number One." Amen.

Just between you and Fatigue Cracks we like *Life* (16th place, 3814 pages) better anyway because they have more Bosun's Mates, little boys that like to fish, Bock beer, Irish setters, the Infantry, Friendship sloops and Marilyn Monroe calendars.

Dear Editor

As you can well see, this column serves several purposes. It permits us to make wise cracks and serves as a useful perch from which we can do a lot of bragging under the protection of "humor." (now cut *that* out!).

Many magazines with similiar columns from time to time print letters received from friends which say "You're tops. Keep it up!" You know. Well, we get thousands of those, too. Thought you'd like to read one, this was actually received last week. And he's an old friend.

Dear Sir:

Sometime since you heard from me. My peace of mind has been upset through some Scotch. Before the flood in Holland dreamt of seeing a serious lightning streak last Dec. Also one 2 weeks ago of the fastest train, 100 miles an hour. Lit up area of Rochester. I invent an idea speaking of this. Do you know what time the time was invented and who invented it. I have one on Ohio and when its Springtime I want a Wife Episcopal kind. Don't like the word Hate. Smart as any man living in this area. Could write you lot more further courtesy you have shown in past 31 seasons employed by our Street Dept. Going on again by April King Street Sweeper. Wrote a piece on Town Affairs 1910-11. Who is Harry James.

Yours truly,

Don't know exactly how to answer it. But much appreciated.

Puzzlers

Here are some more winners of the fisherman puzzle: G. K. Pflederer, John Demmler, J. S. Prifogle, E. H. Heywood and Charles Gathey.

New Puzzle: A cow tied with a rope 45 feet long to a stake in the center of a pasture can eat all the grass within her reach in one-and-a-half days. Assuming that the cow would consume grass at the same rate, how long would it take her to eat all the grass within reach if 15 feet were added to the tie rope? Many thanks to Mr. Rice for this one.

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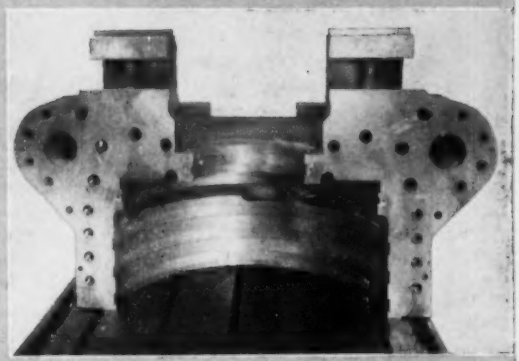
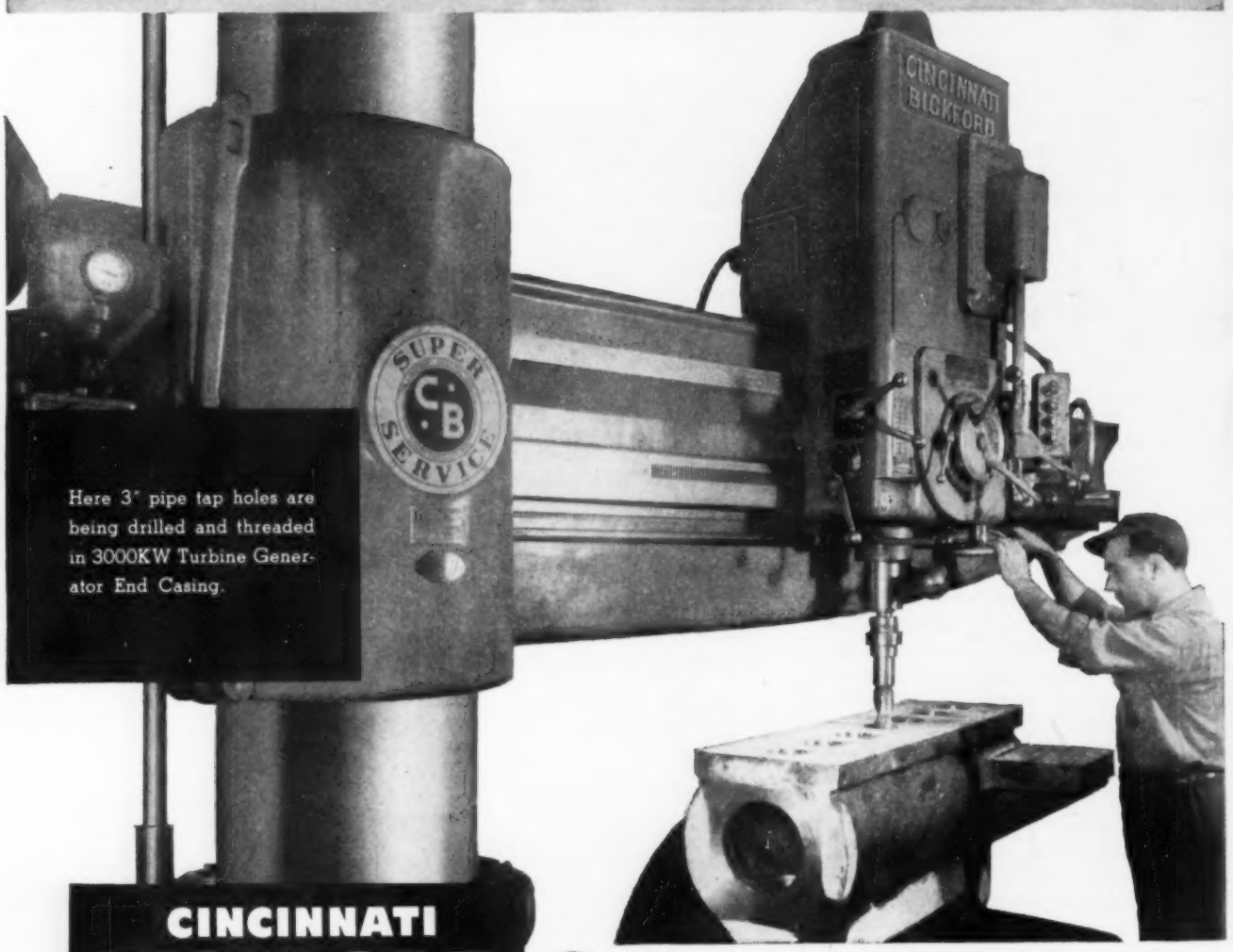
Write us for descriptive literature, or consult our Engineering Department on drilling needs.



Photos—Courtesy Worthington Corporation, Steam Turbine Division, Wellsville, N. Y.



Here 3" pipe tap holes are being drilled and threaded in 3000KW Turbine Generator End Casing.

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Cincinnati 9, Ohio, U.S.A.

Dates to Remember

Meetings

April

STEEL SHIPPING CONTAINER INSTITUTE, INC.—Annual meeting, Apr. 7-9, Palm Beach Biltmore Hotel, Palm Beach, Fla. Institute headquarters are at 600 Fifth Ave., New York.

LEAD INDUSTRIES ASSN. — Annual meeting, Apr. 9-11, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 420 Lexington Ave., New York.

ELECTROCHEMICAL SOCIETY—Spring meeting, Apr. 12-16, Statler Hotel, New York. Society headquarters are at 235 W. 102nd St., New York.

EXPOSITIONS

WESTERN METAL SHOW — March 23-27, Los Angeles.

MATERIALS HANDLING SHOW — May 18-22, Philadelphia.

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

AMERICAN SUPPLY & MACHINERY MANUFACTURERS ASSN., INC.—Annual convention, Apr. 13-15, Miami, Fla. Association headquarters are at 814 Clark Bldg., Pittsburgh.

AMERICAN SOCIETY OF LUBRICATION ENGINEERS — Annual meeting and lubrication exhibit, Apr. 13-15, Statler Hotel, Boston. Society headquarters are at 343 S. Dearborn St., Chicago.

AMERICAN GAS ASSN.—Sales conference, Apr. 13-15, Warwick Hotel, Philadelphia. Association headquarters are at 420 Lexington Ave., New York.

CUTTING DIE INSTITUTE—Semiannual meeting, Apr. 15, Sheraton Cadillac Hotel, Detroit. Institute headquarters are at 1643 National Bank Bldg., Detroit.

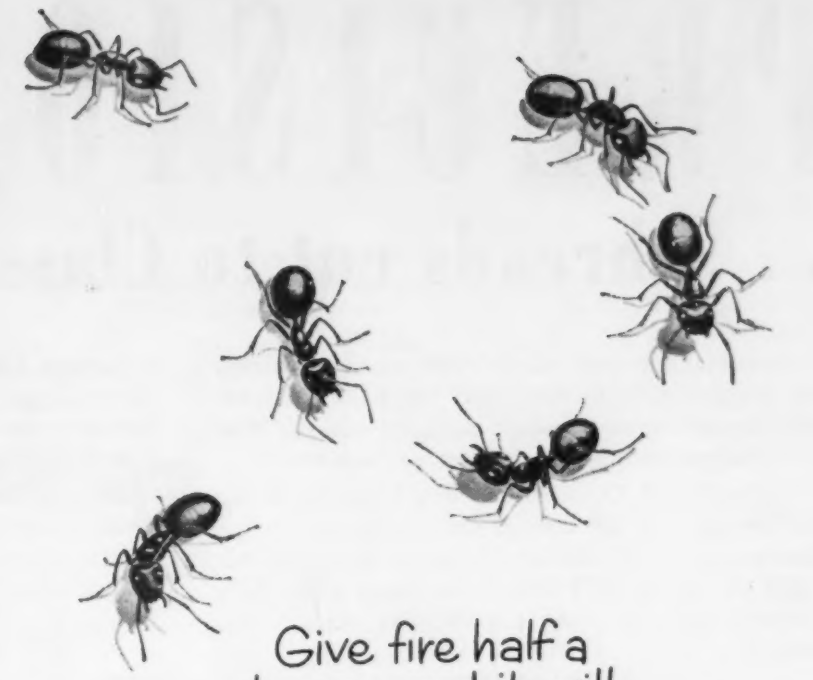
AMERICAN INSTITUTE OF STEEL CONSTRUCTION—Annual engineering conference, Apr. 22-23, Detroit. Institute headquarters are at 101 Park Ave., New York.

NATIONAL PETROLEUM ASSN.—Semiannual meeting, Apr. 15-17, Cleveland Hotel, Cleveland. Association headquarters are at the Munsey Bldg., Washington.

GRINDING WHEEL INSTITUTE & ABRASIVE GRAIN ASSN. — Spring meeting, Apr. 16-19, The Homestead, Hot Springs, Va. Institute headquarters are at 2130 Keith Blvd., Cleveland.

NATIONAL SCREW MACHINE PRODUCTS ASSN.—Annual meeting, Apr. 18-23, St. Moritz Hotel, New York. Association headquarters are at 2860 E. 130th St., Cleveland.

METAL POWDER ASSN.—Annual meeting and Metal Powder Show, Apr. 21-22, Hotel Cleveland, Cleveland. Association headquarters are at 420 Lexington Ave., New York.



Give fire half a chance and it will over-run you like a swarm of ants.
You must stamp it out anywhere it shows itself.
In the paint locker, power plant, garage.
That calls for a battery of strategically placed KIDDE Portable Fire Extinguishers.

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. . . threads cut to Class 7 tolerances

Continuous threads cut on studs must meet exacting requirements to withstand the high pressures and temperatures to which pressure vessels, steel pipe flanges, fittings, and valves are subjected.

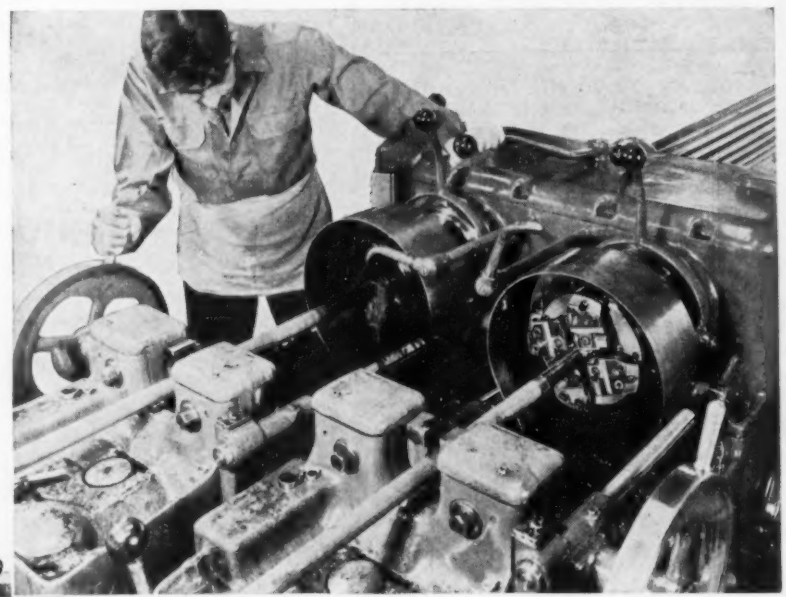
At the R.E.C. Corporation, New Rochelle, N. Y., continuous 1⅜" 8P threads are cut to within pitch diameter limits of .002 on 12-foot heat-treated bar stock of 269 to 311 Brinell hardness. The fully threaded bars are then cut into the desired stud lengths.

By using Double Head LANDMACO Leadscrew Threading Machines equipped with Hardened and Ground 2" LANCO VV Heads, threads ranging in diameter from ½" to 2" are cut in one pass with consistently fine finish to Class 7 tolerances. The leadscrew provides a positive, mechanical means of feeding the work into the die heads, thus assuring the maintenance of close lead tolerances.

Even on this precision threading operation, net production is good, averaging 36 linear feet per hour at a cutting speed of 25 surface feet per minute. An average of 108 linear feet of threads is cut between chaser regrindings, resulting in low tool cost and minimum down time.

Having given many similar outstanding performances in other fields, LANDMACO Machines can help to cut costs, step up output, and improve finish and accuracy in your thread production.

For complete information, write for Bulletin H-75.



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THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Deoxidation Studies Show Advantages of Silicomanganese

Silicomanganese has proved to be highly efficient and economical as a furnace block and deoxidizer, as well as an alloy addition. Steel producers have found that it saves furnace time, produces cleaner steel, and increases the yield of rolled products.

Excellent Blocking Addition

When used as a blocking addition, silicomanganese stops the carbon-oxygen reaction in the open-hearth furnace and permits close control of analysis. The alloy has a ratio of approximately 3.5 manganese to 1 silicon. This proportion will produce a high degree of deoxidation in the furnace.

Why Silicomanganese Is Effective

The carbon boil is arrested more positively by this combination alloy, containing both silicon and manganese, than it is by larger amounts of silicon alone. As a result, close control of the carbon level can be maintained. Also, because of the low carbon content of silicomanganese, the heat may be blocked at a comparatively high carbon level. This saves furnace time, which is critical in reducing costs. Since silicomanganese gets more oxygen out of the bath than silicon alone, the steel is cleaner and has improved surface quality.

Metallurgical Studies Made

Work done by Herty and his associates (1) showed that manganese tends to flux silica inclusions resulting from deoxidation, and permits them to grow in size so that they float out of the bath more rapidly.

More recently, it was found by Hilty and Crafts (2) that manganese and silicon in combination lower the oxygen content much more than silicon alone (see Fig. 1). They also determined that, although manganese by itself is not a strong deoxidizer, it substantially intensifies the deoxidizing power of silicon.

It was shown that in steels with lower silicon contents (below 0.05 per cent), manganese in the amounts usually present as a residual has a strong influence. However, in the silicon range normally used for deoxidation (0.05 to 0.25 per cent), more manganese is required to obtain the full benefit of the combined deoxidizers. For example, at 1600 deg. C, iron with 0.10 per cent silicon and 0.10 per cent or less manganese contains about 0.017 per cent oxygen. With 0.50 per cent manganese, it contains only 0.009 per cent oxygen (see Fig. 1).

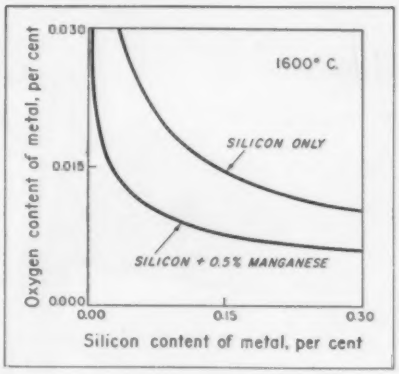

Fig. 1. Limit of solubility of oxygen in iron-silicon alloys, plain and with 0.50 per cent manganese at 1600 deg. Centigrade.

These data thus confirm an observation made by Tenenbaum and Brown (3) that steel as tapped from the furnace is materially lower in oxygen after blocking with silicomanganese.

In another study, made by Silliman and Forsyth (4) it was demonstrated that heavier than usual additions of silicomanganese result in a marked improvement in surface quality. About twice the usual addition of silicomanganese gives a substantial increase in the yield of finished product.

Silicomanganese Produces Cleaner Steel

Initial deoxidation in the furnace with silicomanganese produces very clean steel, particularly in grades below 0.25 per cent carbon. Several factors contribute to the cleansing action of silicomanganese. The amount of dirt in steel seems to be proportional to the maximum oxygen content prior to final deoxidation. Heats that are oxidized to a low carbon and recarburized, as were early rail and forging steels, are dirtier than those in which the carbon is "caught on the way down."

It is also well recognized that medium-manganese and low-carbon steels that are blocked at higher carbon (lower oxygen) contents, with low-carbon ferro-alloys, are cleaner than those taken to a lower carbon level and recarburized with high-carbon ferro-alloys. Silicomanganese is low enough in carbon to block at higher carbon levels. As pointed out by Tenenbaum (5), there is also a decided economic advantage in not driving to such low carbon contents before blocking.

Suitable For Ladle Additions

In addition to its use as a bath deoxidizer, silicomanganese has proved particularly effective as a ladle addition for the deoxidation of semi-killed steels. The alloy is also used to provide the complete ladle addition of manganese in the manufacture of medium-manganese, acid-steel castings.

Metallurgical Service Available

Our metallurgists will be glad to help you with the use of ELECTROMET silicomanganese. This alloy contains 65 to 68 per cent manganese, and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades. All grades are furnished in a lump size of 75 lb. x 2 in. and in a crushed size of 2 in. x down. If you wish further information, please write, wire, or phone the nearest ELECTROMET office: in Birmingham, Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

References

1. C. H. Herty, Jr., C. F. Christopher, M. W. Lightner, and H. Freeman: "The Physical Chemistry of Steelmaking: Deoxidation of Open-hearth Steel with Manganese-silicon Alloys," U. S. Bur. of Mines, Carnegie Tech. and Min. and Met. Advisory Boards, Coop. Bul. 58, 1932.
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4. L. R. Silliman and H. F. Forsyth, "Deoxidation vs. Surface Quality," Open-hearth Proceedings, 32, 1949, pp. 218-224.
5. M. Tenenbaum, "The Economic Aspects of Deoxidation," Open-hearth Proceedings, 28, 1945, pp. 349-352.

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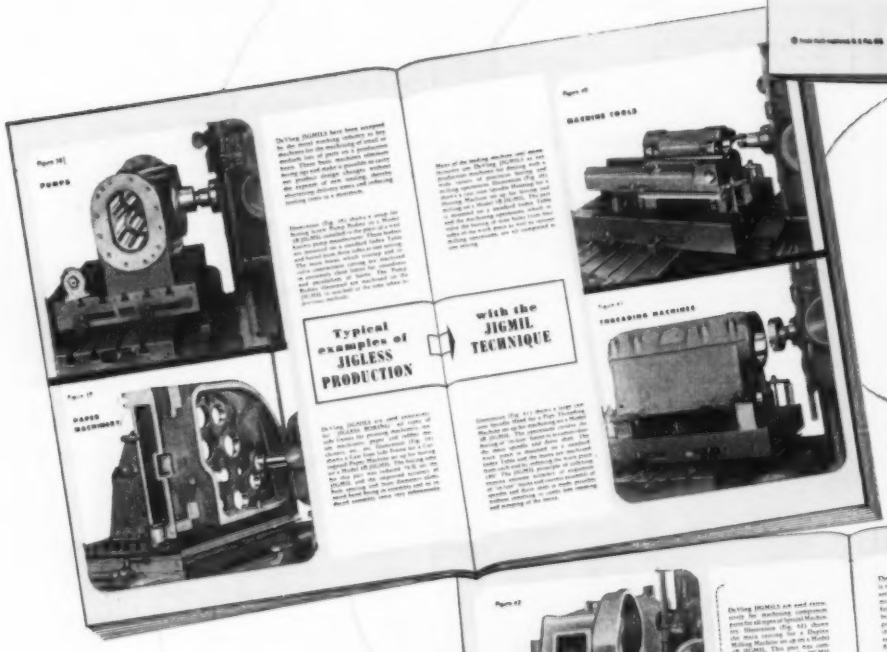

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the Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

SPRAYING OR PAINTING three coats of a special aluminum composition on the exterior of acid cooling coils has protected them for well over a year in a number of plants. One installation coated 2½ years ago is still in service. The process has also been used to line the tanks of ships carrying vegetable oils.

PRODUCTIVITY PAY INCREASES AWARDED RAILROAD WORKERS are viewed by labor leaders as a challenge to do "at least as well" in other industries. A recent decision awarded a 4¢ per hour boost to the 1.3 million rail workers throughout the nation.

NEW BORON STEELS are approaching interchangeability with the 8600 steels for many applications. Distortion is less of a problem today although high core hardness in thin sections is still troublesome.

U. S. AUTOMAKERS FACE NEW COMPETITION ON EXPORT sales to Latin America. European cars such as Austin, Hillman Minx, Skoda, Renault and others are now being assembled in Mexico for sale throughout South America. Fiat plans complete manufacture of trucks in Mexico in 1954.

MUNITIONS SHIPMENTS TO NATO have quietly been stepped up in the past month. Volume moving through Atlantic ports now is making space for other cargoes hard to find.

SOME SECRETS OF AUTO ENGINE WEAR are being unlocked with use of radioactive isotopes. Tracers can eliminate tedious weight studies, provide continuous measurements. Tests can also be made in a moving car under road conditions.

STEEL INDUSTRY INTEREST in plastic pipe is getting warmer. At least three major steel companies have tried to buy a West Coast firm which has developed a high-speed production process for centrifugally casting reinforced thermosetting plastic pipe.

INDIVIDUALLY POWERED RAILWAY PASSENGER CARS, a big money-saver for long-trip railroading, are now seen as a boon to commuters in thickly populated areas. In addition to providing fast express and local service, new cars also promise to revive local rail travel.

PLASTIC BAGS ARE SEALED in England with a small, low-power rf oscillator. Roller type electrodes are used to give seam welds. The portable oscillator unit, built from standard components, can also be used for low-power heating requirements.

SAVINGS UP TO 75 PCT IN ROLL MACHINING TIME have been gained at one plant with a new hydraulic lathe. Hydraulic pressure keeps the cutting tool at constant pressure, materially increases tool life.

TRANSISTOR PRODUCTION, spurred by government and commercial demands, is moving faster. Chemical research teams are scouting cheaper transistor materials to replace germanium. Transistors are being built as plug-ins. Sockets of glass-bonded mica offer good mechanical and electrical properties.

Like the right size shirt

CMP THINSTEEL TRADE MARK

is tailored to your need

Buying steel is very much like buying a shirt—you prefer to buy the steel or the shirt that EXACTLY fits your requirements. True, any item made to fit a particular need may cost a little more than a product offered for all-purpose useage; but the first cost, particularly the "first steel cost", may be relatively unimportant. The end-product cost is the important consideration. If cold rolled strip or spring steel is involved in fabriaction of component parts for your end-products, and the labor cost for fabricating and assembling those component parts is an important part of your total cost, you'll want to investigate CMP strip products.

CMP strip can be made to fit the most exacting needs, whether it be in terms of close tolerances, uniformity of structure, temper, finish or physical properties. The use of specially prepared CMP strip made to the measure of a particular processing or end-product requirement is contributing to lower total costs for many manufacturers. We'll welcome the opportunity to "try CMP strip for size" in your fabricating or assembly operations. Don't compromise steel quality for first steel cost.

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AIR CONDITIONING: Heats Up New Boom

Appliance makers plan for high demand for cooling units . . . Newcomers enter field as price cuts loom . . . Year-round units more popular . . . Materials adequate—By G. G. Carr.

Nothing will be hotter this summer than air conditioning. Appliance makers, still not over television, are breathing the heady air of a new boom this year. And everybody wants to get into the weathermaking act.

Air conditioner sales had been sluggish in 1951, leaving the industry with what looked like heavy inventories in spring 1952. The heat wave fixed that. Inventories evaporated, replacements were wiped out, and production was pushed to capacity limits. A year later inventories are still low.

Customers Wanted More

Air Conditioning & Refrigerating Machinery Assn. estimates manufacturers shipped 341,000 room air conditioners in 1952, with a dollar value of $66,180,000. This compares with 237,490 units at $45,824,000 in 1951. Including inventories, the association calculates dealers sold about 412,000 units last year. And there is no doubt more could have been sold if they had been available.

Buying season this year has begun one month ahead of time. Carrier Corp. has already sold over 1000 new units in New York City alone. Home sales of air conditioners were never high in the past, but about 65 pct of all made are now aimed at eventual private home consumption.

Competition Heats Up

You shouldn't have any trouble getting a unit this summer. With the home air conditioner market at a challenging 1.5 pct of saturation, and industrial and commercial demand climbing, the air conditioners are busting their buttons to find and sell the customer first.

In the Midwest alone, a major farm implement manufacturer, two large appliance firms and a firm that began in the electronics field have this year gone into the air conditioning business. Production sights have been raised as much as 100 pct over last year, and at least two major producers are sending out sales forces with quotas up 400 pct from '52 levels.

Newcomers range from large companies who are diversifying their output to very small sheet metal fabricators. The big ones are marketing their goods through their former outlets. Hence the appliance distributor, and even the farm equipment distributor, is carrying air conditioning as a portion of his stock in trade. And though urban areas have consistently outsold rural areas, the farmer will be exposed to at least samples of the new product.

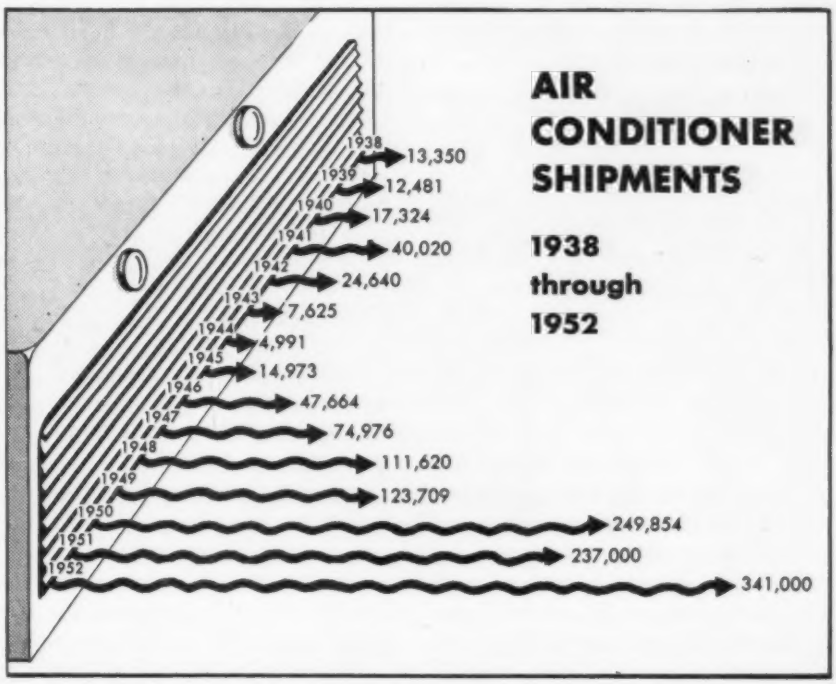
General Electric Co. told THE IRON AGE it plans to increase production 30-35 pct this year, not counting its forthcoming Hotpoint line. And GE is also planning on getting its "fair share" of electric motor sales to other manufacturers of air conditioners.

Westinghouse sees its sales to industry and business establishments up 32 pct this year, hopes for a home market of 25,000 to 30,000 complete ac systems in the same period. The company expects its sales to homes to be at the 60,000 level by 1958.

Work Two Shifts

To back up its expectations, Westinghouse's Sturtevant Div. will work two 40-hr shifts against 1½ shifts last year.

One drawback to air conditioning expansion in the past has been that there were only about a dozen firms actually making the hundred-odd brands on the market. Many newcomers are building their own facilities, and estab-



lished manufacturers are expanding their existing facilities.

One of the largest manufacturers, who markets under its own name and also supplies units to other firms for sale under their brand names has expanded to double 1952 capacity. Another large manufacturer also planning a 100 pct output increase will do all his own assembly, but has arranged to have 40 pct of other operations subcontracted.

Price Cuts Loom

Carrier Corp. is planning production "at least twice that of last year," Cloud Wampler, president, told THE IRON AGE. The company recently completed a new building exclusively for room air conditioners, will build all its own there.

Window units, with price tags from $199 to $400 plus, are the leaders. Newcomers in the field are concentrating on this theme, will move to larger "console" and home-size units later. Established firms are definitely trending to model diversification.

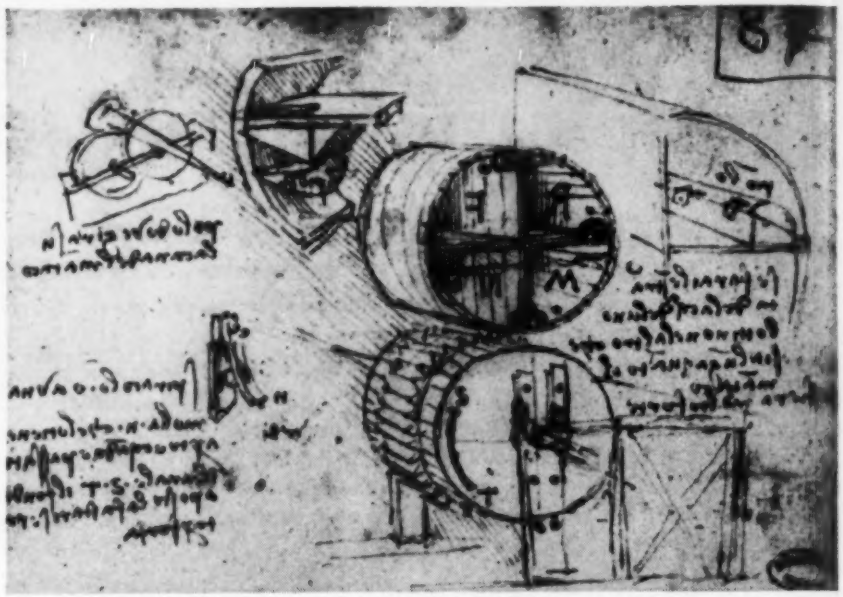
Air conditioners are still big ticket items. But Philco has already cut prices, some as much as $100. Carrier will pre-pay all freight charges. There is a general feeling in the industry that competition will have its classic effect, particularly since several important newcomers haven't yet announced firm prices.

"Will Be Highly Competitive"

One large firm, new to the field, told THE IRON AGE, ". . . we believe that the market will be highly competitive and many new elements are entering the business and will be striving to obtain a foothold in the market."

Materials don't appear to be too much of a headache, although some difficulty is anticipated, particularly with copper and aluminum. Steel sheets are tight, and plate supply spotty, but most manufacturers feel they will have enough to meet schedules.

Whitest hope of the future is the all-year-round house air conditioner. Several companies are producing these devices, report extremely good acceptance of their products by the public.



IT'S NOT NEW. Drawing is Leonardo da Vinci's sketch of an air conditioning machine he built for an Italian noblewoman, Beatrice d'Este, about 1500. Air was cleaned and cooled by contact with water, then pumped by the wheel into the signora's boudoir. Photo courtesy International Business Machines Corp.

There is a steadily growing demand in all areas for one unit to handle both cooling and heating. National Assn. of Home Builders is admittedly very interested. And Carrier Corp. reports signing contracts with Gunnison Homes, Inc., Knox Corp. and American Houses, Inc., will boost output 400 pct on its Home Weathermakers.

Infant prodigy of the whole industry of course is the heat pump. A few firms are marketing it now, but mainly in the South. This area is generally more disposed to consider air conditioning a necessity, and southern utilities are happy to find something that will narrow the gap between high summer and low winter power demand. But for most regions power costs at present restrict heat pumps to experimental use.

New homes are getting harder to move, and despite contractors' claims that they must cut costs, the home air conditioner is moving down into lower cost housing brackets. One large producer reports fair inventories of home units for seven-room houses. His supply of units designed for five-room houses is much lower.

Admittedly, the small housing contractor would like a unit that (1) costs nothing to operate, (2) costs nothing to install, (3) costs nothing. But he will compromise, and according to sales reports seems to be doing so more and more. And by third quarter at least one major producer will probably come out with a unit about 30 pct under present prices.

Helps Sell Homes

More and more pre-fab homes are being offered in the low ($8000-$12000) price bracket with packaged air conditioning included in the above price. Similarly, new mass-production housing developments have been incorporating air conditioning as a portion of the finished price. It requires some pushing, but in several developments has proven a selling gimmick equal to the automatic kitchen and the built-in home laundry.

Installation in an older home, equipped with conventional heating facilities, is more difficult. Costs of installation even in a new home begin at about the thousand dollar mark. And operating costs are estimated at 50¢ to $1 per day. But the customer continues to buy.

WEST: Industry Spirited and Sprouting

Jam-packed metals show points to growth of western industry . . . Foreign machine tool makers push for western sales . . . Limelight on light metals . . . Local tools—By *T. M. Rohan.*

The Western Metals Show—fed by booming local industry and eastern firms eager to crash the western market—gets bigger every year. It is clear evidence that western industry is spirited and sprouting fast.

Attendance at last week's metalworking exhibitions and technical sessions hit about 53,500 in Los Angeles' Pan Pacific Auditorium, creeping up on its big brother, the national show at other cities which draws about 75,000 to 80,000 and has about 65 pct more floor space. It was twice as big as the Los Angeles 1949 show and 50 pct bigger than the 1951 Oakland show.

Forced Out of Booths

Despite the overflow into two huge tents erected alongside the auditorium, crowds were so thick salesmen were sometimes forced out of their booths and found it difficult doing business with prospects.

Versatile foreign machine tools, many shown by eastern importers for the first time, were gathering places for the curious. Welding, foundry, heat treating and light metals exhibits most useful to the typical small western job shop, commanded greatest attention.

Foreign machine tool exhibitors —Italian, Swiss, Japanese, Dutch, Belgian and British—all reported lower cost and versatility and availability of their products are pushing western sales upward. Principal takers are aircraft plants where incessant design changes, rearranged production schedules and precision needs are problems.

Western distributors are also building up spare parts stocks and bringing over technicians to train U. S. workers in getting the most out of the tools. A good many new types were shown, some arriving only days before the show opened.

Several Western made machines, mostly of smaller types, also made their first appearance. Notable was the Anfin gearless turret lathe made in Redwood City, Calif. This machine transmits power from a 2-speed motor through a variable pitch multiple belt sheave and magnetic clutch giving it infinite speed adjustment.

The belt and clutch arrangement is designed for resiliency in cutting stainless steel and other tough metals, eliminating gear tooth cracking of conventional machines.

Another low cost ruggedly-built Golk vertical milling machine being built by a young San Francisco machinist resulted in three orders off the floor. Only about 15 have been built, the first one on spare time.

The latest of a line of still evolving shell molding machines developed by Stanford University graduate students drew many visitors. Started as a school project, the machine has blossomed into a student corporation with local financial backing. Its appearance was sponsored by a plastics firm interested in promoting shell molding, especially in Western job shops.

Another local product is a Burbank-made 24-in. slip roll in which the top roll lifts completely away permitting removal and insertion of closed sheet metal rolls without disturbing the pressure adjustment.

Several midwest and eastern titanium producers were also in evidence, hoping to crack the western air frame market. This represents substantial tonnage although the major immediate market for them is in aircraft engines predominantly made in their immediate area. Titanium ingots from Nevada are often presently flown eastward for finishing, then re-shipped westward for airframe use.

Lindberg Engineering, always ready with a gimmick, this time had visitors pose for their picture-in-a-minute portrait only to find the finished picture showing them peering through a window at a maiden taking a bath.

Spotlight Light Metals

The light metals, especially titanium, got the limelight at technical sessions. Varying attempts at improving machinability, heat treating, strength levels, wear resistance and ductility, of the wonder metal and its alloys generally met with only lukewarm success, it was reported.

Papers on zirconium, valuable for nuclear reactors due to low neutron absorption were popular. Major strides were reported in production of high purity sponge at U. S. Bureau of Mines in Albany, Ore.

Well attended sessions on nondestructive testing indicated development is sorely needed. An aircraft engineer reported $50,000 discards in 90 days.

MEASURING MUZZLE of 5-ton Army rifle displayed by National Supply Co., Torrance, Calif., are Herman Levano and Miss Jean Kupps. The 28-ft gun was displayed at the Western Metals Exposition.

COAL: Can Cure Its Economic Ills

Sickly bituminous industry won't get well overnight, but long-term prognosis is good . . . Pipeline a healthy symptom . . . Expect oil, gas supply depletion—*By J. B. Delaney.*

There's a long convalescence in store for the soft coal industry. But bituminous medicine men are confident of a cure.

Sickly for the past year, the industry's production pulse dropped nearly 13 pct to 465 million tons in 1952. And a further weakening of consumption rate, perhaps to as low as 430 million tons, is diagnosed for this year.

No Wonder Drug

The industry's doctors don't expect to turn up any wonder drug in the near future, but feel sure that sound treatment will see the patient through.

Their prescription leans heavily on (1) research and market development, (2) anticipated growth of electrical energy use, and (3) eventual displacement of oil and gas under power-generating boilers.

Research is moving ahead on a multitude of fronts, including gasification of coal, synthetic liquid fuels from coal, the coal pipeline, the coal-burning gas turbine, and others.

Can Use Pipelines

After months of development work on a 3-mile 12¾-in. experimental coal pipeline near Cadiz, Ohio, Pittsburgh Consolidation Coal Co., world's largest commercial producer, is satisfied coal can be moved to market in this manner economically. Proof of this is the company's activity in signing up pipeline customers, particularly in the Great Lakes area.

The pipeline is one facet of the industry's battle to throw off the handicap of high railroad freight rates. Another is development of belt conveyer systems for short hauls and perhaps later cross-country systems.

Wait and Pray

Coal producers apparently can do little but bide their time in the matter of competition from oil and gas. But they believe the day is not too far off when diminishing supplies of these fuels will bring coal back into the picture once again.

Some authorities believe oil production in America will reach a peak in 1960. When this happens and when gas reserves decline, these fuels will be conserved for more specialized purposes than providing heat for power generation, leaving the field to coal.

Things To Do

Joseph Pursglove, Jr., vice-president, research and development, for Pitt-Consol, foresees four major opportunities for expansion of coal markets, possibly within the next decade:

1. By reducing the delivered price of coal, at least 30 million tons of coal a year can replace oil and gas under boilers.

2. Working with electric utilities to reduce power costs to their customers would expand the market and provide need for another 100 million tons a year more than present utility expansion plans call for.

3. By working out methods of converting coal into a natural gas equivalent, the industry could have a market for at least 100 million tons a year at gasification plants.

4. Development of new methods of converting coal into liquid fuels would give a market of 180 million tons a year in synthetic fuel plants.

What Ails It

Coal's sickness comes from several causes, including (1) Competition from oil and gas in the home and railroad markets, (2) Residual fuel imports, particularly from Venezuela and nearby areas, (3) A weak export market, (4) The mild winter, and (5) Heavy consumer inventories built up in anticipation of a strike that didn't come off.

King Coal's biggest customer—electric utility companies—are now in a position to wrest price concessions from the industry. Along the eastern seaboard, where the availability of cheap residual fuel is most felt, the utilities have negotiated contracts effective Apr. 1 calling for coal price cuts of 20¢ per ton. A similar price break is looked for on metallurgical grade coal.

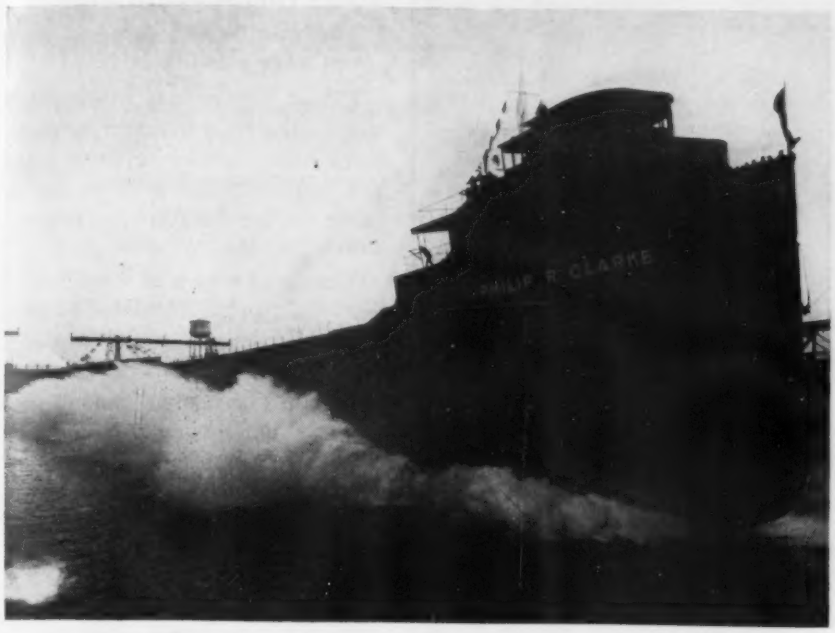
January Steel Shipments

As Reported to the American Iron and Steel Institute

STEEL PRODUCTS	CURRENT MONTH				
	Carbon	Alloy	Stainless	Total	Pct of Total Shipments
Ingots	94,663	20,365	2,243	117,271	1.7
Blooms, slabs, billets, tube rounds, sheet bars, etc.	184,095	53,804	2,554	240,453	3.4
Skelp	9,570	.....	.....	9,570	0.1
Wire rods	84,646	1,463	417	86,526	1.2
Structural shapes	412,533	5,488	45	418,066	5.9
Steel piling	32,450	3	.....	32,453	0.5
Plates	674,315	36,585	2,891	713,791	10.1
Rails—standard	153,410	23	.....	153,433	2.2
Rails—all other	12,349	5	.....	12,354	0.2
Joint bars	8,750	.....	.....	8,750	0.1
Tie plates	32,559	.....	.....	32,559	0.5
Track spikes	8,316	.....	.....	8,316	0.1
Wheels	29,251	11	.....	29,262	0.4
Axles	18,407	4	.....	18,411	0.3
Bars—hot rolled	634,402	214,896	4,200	853,498	12.1
Bars—reinforcing	146,148	.....	.....	146,148	2.1
Bars—cold finished	169,671	34,391	5,842	209,904	3.0
Tool steel	1,468	8,194	.....	9,662	0.1
Standard pipe	268,293	45	1	268,339	3.8
Oil country goods	141,060	16,426	.....	157,486	2.2
Line pipe	260,326	113	.....	260,439	3.7
Mechanical tubing	72,229	27,983	515	100,727	1.4
Pressure tubing	38,779	4,640	1,318	44,737	0.6
Wire—drawn	268,305	5,385	3,708	277,398	3.9
Wire—nails, staples	47,893	.....	.....	47,893	0.7
Wire—barbed, twisted	18,392	.....	.....	18,392	0.3
Wire—woven fence	25,927	.....	.....	25,927	0.4
Wire—bale ties	2,199	.....	.....	2,199	....
Black plate	86,576	.....	.....	86,576	1.2
Tin & terneplate—hot dipped	121,634	.....	.....	121,634	1.7
Tin plate—electrolytic	311,635	.....	.....	311,635	4.4
Sheets—hot rolled	637,592	29,548	1,894	669,034	9.5
Sheets—cold rolled	854,510	8,998	11,895	875,403	12.4
Sheets—galvanized	201,461	11	.....	201,472	2.8
Sheets—other coated	21,342	.....	.....	21,342	0.3
Sheets—enameling	16,470	.....	.....	16,470	0.2
Electrical sheets, strip	9,118	57,980	.....	67,098	0.9
Strip—hot rolled	196,661	3,920	394	202,975	2.9
Strip—cold rolled	168,710	2,257	19,086	190,053	2.7
TOTAL	6,478,115	532,538	57,003	7,067,656	100.0

During 1951 the companies included above represented 98.5 pct of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.



IRON ORE: Steam's Up for Lake Shipping

Shipping season starts as half of Great Lakes ore carriers move north . . . Expect to haul 100 million tons . . . Good steel operations will help . . . Stockpiles high—*By R. M. Lorz.*

At least half of the Great Lakes ore fleet moved northward this week as the 1953 shipping season got under way. With some 150 boats plying familiar routes by mid-week and steel production setting monthly records, 1953 promises to be *the* year in Lake Superior ore.

If the industry can steer a safe course around labor squalls, it expects to have at least 100 million gross tons of ore at Lower Lake ports before the season closes.

These optimistic predictions seem well founded since most informed sources believe steel mills will operate at high-level capacity through the rest of the year.

Stockpiles Stay High

Shipping and mining officials generally hesitate to predict they will top the 100-million-ton goal because present stockpiles have remained surprisingly high. According to the Lake Superior Iron Ore Assn. there were 29,948,749 tons of ore in U. S. stockpiles on Mar. 1, 1953.

Last year when the season ended stocks on hand totaled 29,207,005 tons. Similarity of figures is surprising because an estimated 22 million tons of ore failed to reach Lower Lake ports last July and August because of the strike.

Comfortable scrap inventories in most mills may also militate against an all-out shipping season. (An estimated 105 million tons could be hauled under optimum conditions.)

Haul More in '53

Although there is speculation about the eventual level of total tonnage in 1953, agreement on one point is general — the industry should have no trouble at all in steaming past the 74,910,798-ton total hauled last year.

New additions to the fleet will play an important part. When full operations get under way after insurance premiums are reduced on Apr. 15, 283 vessels will be carrying ore to the nation's blast furnaces. Two of these, the *Ernest T. Weir* and the *J. L. Mauthe*, are making their first trips. They will be joined by at least four other new ships before the season closes.

The new ships can make the round trip to Lake Head and back in 5 days. Older vessels take from 7 to 9 days for a trip. That means newer vessels will be able to make an estimated 40 to 42 trips while older boats are completing 30 trips.

In terms of individual tonnage a new vessel will be able to haul some 750,000 tons during the season. Older boats are capable of hauling only 390,000 tons.
(In addition to greater speed, the new vessels have a capacity of 18,000 tons while the older boats average around 13,000 tons.)

Veterans Made Ship-Shape

The fleet this year will also get off to a fast start since most winter repairs have been completed. This week all but eight of the "veterans" had been made ship-shape.

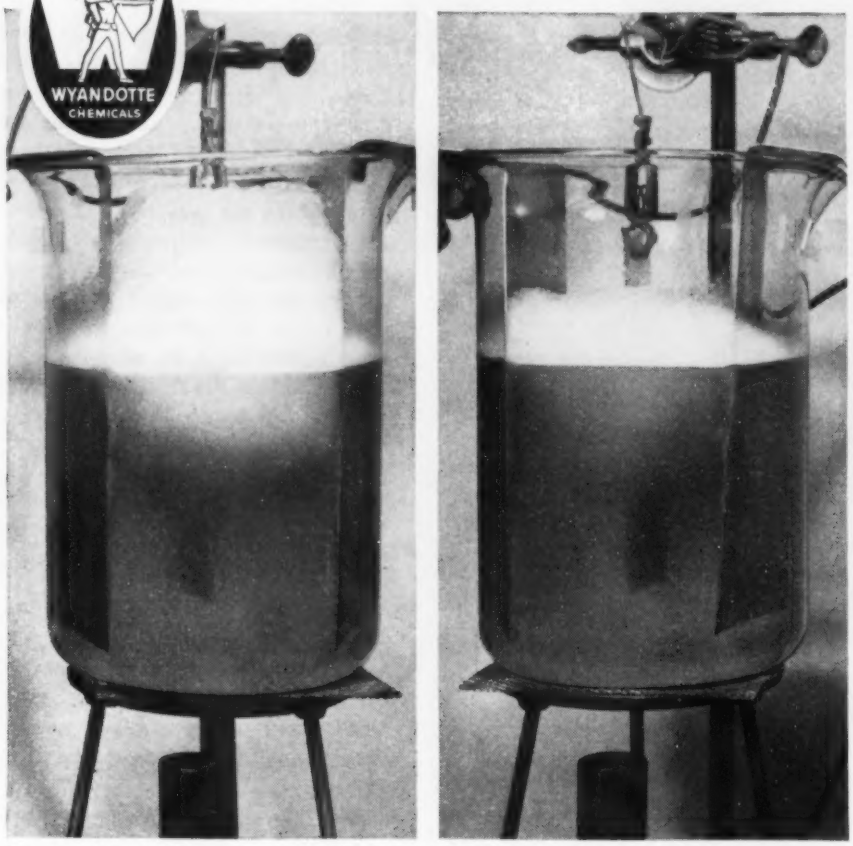
The boats are ready, the weather promises to be good and thanks to a vigorous recruiting job, the 13,000-man fleet will be adequately staffed. In their search for able seamen, Great Lakes ship owners have gone as far south as Tennessee and into Iowa and Missouri. Needs are increasing and 70 pct of their men are of draft age. To maintain high standards of seamanship an officer complement of 274 men, which includes 134 newly licensed officers, is necessary.

Shippers so far are mum when possibility of an increase in rates is mentioned. At press time there was no serious talk of increasing rates negotiated last July.

Contributing to the healthy state of today's ore stockpiles was the prolonged steel strike mid-year in 1952. Although it shut down the ore mines, banked furnaces did not make a dent in ore already shipped.

Rail shipments in 1951 had climbed to a record of almost 8 million gross tons, were a still respectable 5.5 million tons last year. After the '52 strike it was thought that ore shortages this spring would curb steel production but with the post-strike shipping rush these estimates were changed.

Specialists in Industrial Cleaning Products



Comparative foaming test. At left, Wyandotte F.S., prior to latest formula improvement, has average foaming characteristics for a heavy-duty electrocleaner used at a high current density. At right, in the same test at the same high current density, foaming of improved F.S. is greatly reduced. This minimizes explosion possibilities in high-conductivity electrocleaners, as well as problems due to excessive foam carried out on parts.

Improved Wyandotte electrocleaners are non-dusty and cut foam formation 50%!

Now Wyandotte's three great electrocleaners, F.S., B.N. and No. 90 are even better than ever!

Excellent performance characteristics of all three are unchanged! Dustlessness minimizes coughing, sneezing, skin irritation — foam is reduced as much as 50%!

For better electrocleaning at lower cost, use the best electrocleaners on the market: F.S.* for all around heavy-duty anodic steel cleaning: B.N. for versatile direct and/or reverse cleaning of non-ferrous metals; No. 90 for anodic steel cleaning where smuts and/or chrome contamination are particularly troublesome.

Ask your Wyandotte metal cleaning specialist to demonstrate improved F.S., B.N. or No. 90 to you. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Angeles 12, California.* * Reg. U.S. Pat. Off.

CLEANING THE WORLD

Largest manufacturers of specialized cleaning products for business and industry

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Helpful service representatives in 138 cities in the United States and Canada

Expansion

BLAST FURNACES:

ODM asks industry to add 2 million tons more capacity.

Latest government recommendation to the steel industry is that it boost blast furnace capacity 2 million tons over the goal set by Defense Production Administration in December, 1951.

That goal was a 14.7 million-ton pig iron growth calculated to bring annual capacity to about 85 million tons by Jan. 1, 1954.

Industry reported that it now has 245 blast furnaces in operation turning out pig iron and 13 producing ferroalloys. Combined capacity now amounted to 79.4 million tons.

Total Going Up

In addition, said industry, it plans to add another 2.8 million tons during 1953 and at least 900,000 tons during 1954. This would bring the total to about 83.1 million tons.

Not enough to make sure of meeting steel needs under full mobilization, says ODM. The agency revised its goal for the industry and extended the target date by 1 year to Jan. 1, 1955, setting a new goal of 87 million net tons.

Industry's estimate of at least 83.1 million net tons by end of 1954 includes both pig iron and ferroalloy capacity. But the government's 87 million ton goal takes in only pig iron.

No Change in Goal

No change has been made by ODM in its original expansion goal for ferroalloy capacity. This stands at a total of 1,275,000 tons by the end of 1954—an increase of 511,000 tons over 1950.

No specific ferroalloy expansion was reported by the industry last year. It says its 13 stacks, plus production included under pig iron furnaces, can turn out 1,122,000 tons.

The ODM isn't worried about the ferroalloy capacity. It says existing blast units of 500- to 700-ton per day capacity could be diverted to ferroalloy manufacture to meet any extra needs.

STAMPERS: Sheet Supply Hangs on Autos

Troubles with sheet supply depend on Detroit's production rate . . . Trend of mills' sheet production . . . Pressed Metals Institute speakers give tips on business—By R. M. Lorz.

Stampers' troubles with sheet supply will last as long as Detroit can sell all the cars it can make.

Availability of sheet steel for stamping and secondary operations will depend on how the automotive industry fares during the second half of this year.

In the opinion of basic steel men in the Cleveland area, stampers will get some of the sheets they have been crying for only if Detroit has been wrong in scheduling production at a 6-million car rate.

If the automotive industry can market the units it makes when the spring buying rush starts, then steel men believe tightness in sheets will continue to present problems.

Where's the Sheet?

Stampers attending the Pressed Metals Institute meeting who had reviewed predictions of a 124-million ton annual ingot rate crowded Cleveland hotel lobbies and asked the universal question: "Why can't we get all the sheets we need and forget about conversion if basic production is continuing to soar?"

Basic producers had several down-to-earth answers that hinged on the history of the industry's product mix. They pointed out that stampers and fabricators had been hurt by the war years of 1941-1945 when steel was produced only for military and other essential purposes.

Licking The Shortage

In their opinion that fact together with complete obsoletion of sheet producing equipment in 1930 left the basic steel producing industry with a hurry-up job of expansion. This was bound to cause some dislocations.

Steelmakers are licking the problem. Since the turn of the century production of both hot and cold-rolled sheet has increased from an annual average of 800,000 tons to the current rate of about 25 million tons. That tonnage represents 35 pct of all steel produced. Within the next 10 years they expect it to climb to 35 million tons. As the curve ascends stampers and fabricators should benefit.

U. S. Sheet Production
Hot & Cold Rolled

Year	Million Tons
1946	14.01
1947	18.03
1948	19.07
1949	18.6
1950	24.8
1951	25.2
1952 and Present Rate	25.0

Institute members interested in improving a business position, which most admit is good, got some thought-provoking market analysis from guest speakers who emphasized the human equation in business.

Colonel Roscoe Turner, famed aviation pioneer and industrialist, warned PMI members that they were not keeping pace with the Russians in training and interesting our youth in aviation.

"The promotion man is crazy . . . the promotion man is crazy . . . the promotion . . ."

Wake Up and Prosper

His general approach was applied to the retail field by IRON AGE Editor Tom Campbell who asked stampers to wake up to the fact that American business can continue to prosper if it will provide the goods that millions of new buyers want. Mr. Campbell also asked the stampers to think of new home appliances as social factors as well as time savers.

Emphasis at technical sessions held during the 3-day meeting was placed on re-evaluation of standard methods. In a panel discussion on press guarding, everything from basket guards to electronic curtains of light was discussed with all eyes on greater operational safety.

Stampers who attended the session concluded that job shops would have to tailor their press guards to meet individual situations. There were enough revolutionary guards displayed by Institute members to make the job look easy.

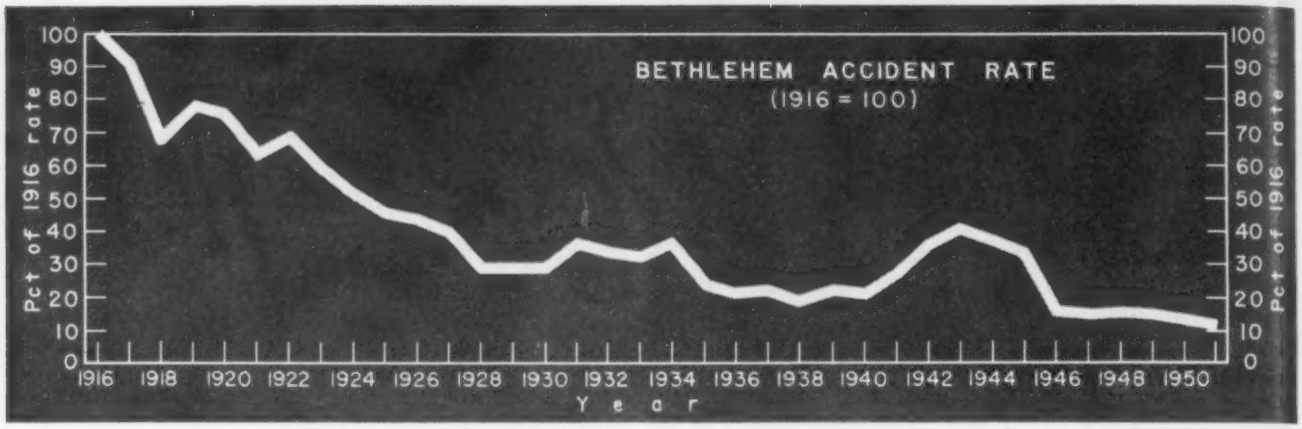
Show Movies

Panel discussions on die designing and breakage and movies on drilling, tapping and counterboring were also featured.

A plea to consult with employees instead of "telling 'em" was issued by Allan Mogensen. In outlining his work simplification plan Mr. Mogensen insisted that astounding economies could be achieved by any management which would consciously look for inefficiencies by consulting the man on the line.

Sign For Chromite Supplies

Defense Materials Procurement Agency has signed two chrome ore contracts. American Chrome Co., San Francisco, will operate the Mouat Mines in Stillwater County, Montana, for 8 years and Kenai Chrome Co. will develop the Red Mountain deposit south of Anchorage, Alaska.



HOUSEKEEPING: Pays Dividends

Good housekeeping pays Bethlehem Steel rich rewards in production, safety, maintenance . . . Helps win impressive honors, saves money and raises morale—By W. V. Packard.

Bethlehem Steel Co. is convinced that good housekeeping pays dividends. Some of them are (1) higher, more efficient production; (2) faster maintenance, with less downtime; (3) greater safety, with less cost and lost working time due to accidents, and higher morale among employees.

Bethlehem people, from top management to superintendents, foremen and men, are proud of their reputation for cleanliness and their spectacular safety records.

It's a great feeling to be No. 1, and they have certainly won honors hands down with amazing consistency when it comes to safety.

Win Eleven Firsts

Records show they have practically monopolized safety honors awarded annually by National Safety Council. For example: In the last 12 years Bethlehem plants have 11 times won first place trophy in Metals Section, Group A, Steel Mills Div. Seven victories were by the Bethlehem plant and four by the Johnstown plant.

During the past 10 years these two plants have captured first place every time, while other Bethlehem plants have racked up 8 seconds and 6 thirds. Last year Bethlehem, Johnstown and Lackawanna plants finished one, two, three in contest covering period between July 1, 1951 and June 30, 1952.

Accidents Cut 89 Pct

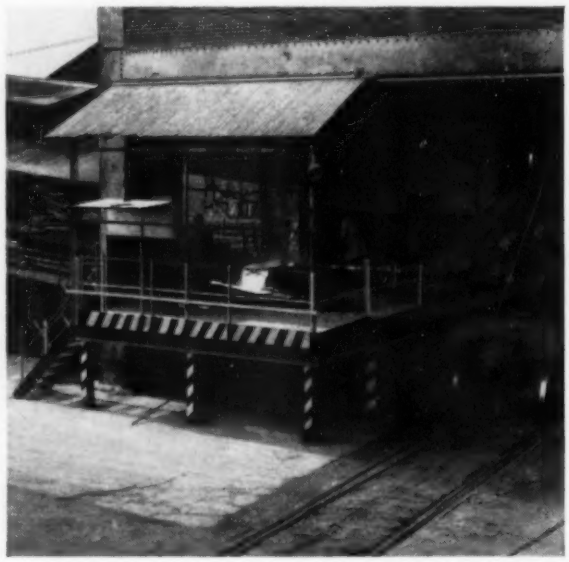
Altogether 33 operations of subsidiary companies won 45 NSC awards in 1952. In addition Naginey quarry won for the sixth year Certificate of Achievement from U. S. Bureau of Mines for no disabling injuries during the year.

Frequency of accidents in Bethlehem plants has declined 89 pct since 1916. This is shown by the chart at top of this page.

To get an idea how Bethlehem compares with other steel companies and industry generally, look at figures for 1951, latest year for which complete statistics are available.

In 1951 Bethlehem's accident frequency rate (disabling injuries per million man-hours of work) was 1.85. For the steel industry as a whole it was 4.50. For all industry it was 9.06.

In the same year Bethlehem's severity rate (days lost from accidents per thousand man-hours of work) was 0.87. For the steel industry it was 1.16. For all industry it was 0.97.



COLOR PAINTING identifies platform supports, protective railings, and toe-board by Steelton plant's pig-casting machine, calls workers' attention to danger spots.

How They Do It

Why is Bethlehem able to roll up safety records with such consistency? The answer seems to be: (1) Good housekeeping and safety have been adopted as company policy, and as such get plenty of attention. (2) Effective management continues to stress company-wide policy of orderliness and maintenance. (3) Employee education is aimed at instilling consciousness of good housekeeping, as well as encouraging rivalry in achievement. (4) Specific routine aids toward cleanliness, safety, and maintenance are carefully planned and programmed in advance.

All these reasons are important, but the last is the real clincher. No amount of

exhortation can induce cleanliness and safety if rank and file employees aren't told how to do it.

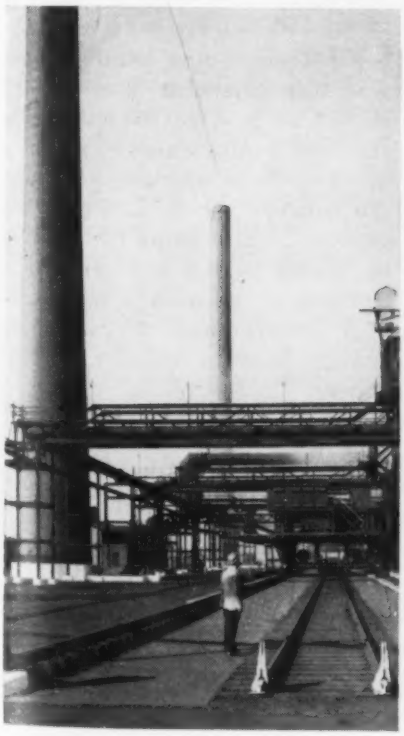
Anticipate Trouble

Housekeeping practices follow the same general pattern at all operations of the company. Maintenance of buildings and equipment at each operation is handled by a service department. By anticipating repairs and following a planned schedule, costly interruptions to production are cut down.

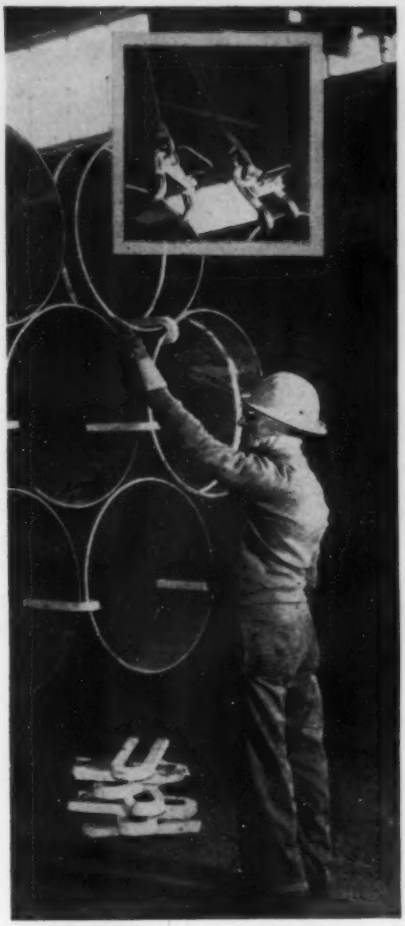
In periods of high steel demand this really pay offs. At Sparrows Point, for example, the company has been scheduling only one of 28 openhearths down at a time. Official rated capacity figures for the industry are established on the basis of 12½ pct, or 1 of every 8 openhearths, down at any given time.

Everyone's Responsible

While maintenance is centralized in Bethlehem plants, good housekeeping penetrates much deeper into the workforce. Each department is responsible for keeping its own area clean and orderly at all times. And each worker is responsible for housekeeping in his job location. Trash cans, brushes, scoops and brooms are kept close at hand.



CLEAN-SWEPT-LOOK beside coke ovens at Sparrows Point reflects good housekeeping policy, reduces chances of accident.



HANDLE on crane hooks saves fingers. Clips keep pipe from rolling on rack. Handle and clips are painted bright yellow.

Superintendents and foremen are naturally responsible for seeing that good housekeeping methods are followed. But it isn't unusual to see the general manager on his rounds jotting in a notebook items which need to be taken care of but have escaped notice by members of the department.

Periodic clean-ups by special policing squads have been eliminated; good housekeeping goes on 24 hrs a day.

Paint Used Three Ways

Contributing to good housekeeping and safety is liberal use of paint. Safety aisles, handrails, walkways, pillars, trucks, and mobile cranes are usually painted yellow.

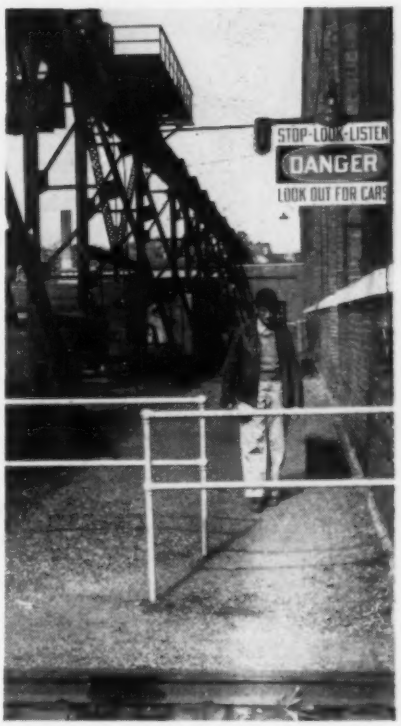
Distinctive painting also permits rapid identification of spare parts. Before company adopted practices of painting them, spare parts were sometimes mistaken for scrap and sent to furnaces for remelting. In addition to saving money, present practice results in neater appearance.

In recent years Bethlehem has done considerable research into scientific use of color schemes for machinery and shop interiors. Use of color painting, combined with attention to natural and artificial light, reduces employee fatigue and raises efficiency and safety. Neat appearance is again a bonus.

Dirt Can't Hide

Good lighting also aids in housekeeping, because dirt and trash don't collect in well lighted corners. Elimination of refuse and greasy spots on floors is also a boon to safety.

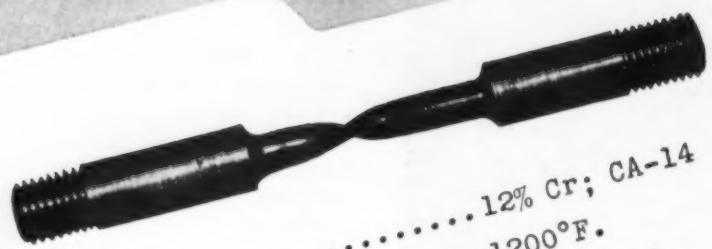
Industrial plants with high accident rates and/or low production efficiency might benefit from Bethlehem's organized emphasis on good housekeeping. Bethlehem management is convinced it pays handsome dividends.



SAFETY GATE at Pottstown works causes men to think twice before crossing railroad tracks. Sign points up hazards.

The Story of a Test

DURALOY



Test Rod.....12% Cr; CA-14
Test Temperature.....1200°F.
Tensile Strength.....38,200 psi.
Elongation (2")..... 29.5%
Reduction in Area..... 86.1%

That's high quality metal! Metal destined for a high alloy casting which has to meet some pretty rigid specifications!

The story we want to tell here is about our Testing Facilities. We have right in our foundry every conceivable testing facility needed when checking static or centrifugal high alloy castings for industry. Where required, we make complete chemical, metallurgical, and mechanical checks and tests. And have both a 400,000 volt X-ray unit and gamma-ray unit, for checking the final casting for hidden flaws.

As we see it, the only way to assure customers of high quality castings is to have and use all necessary facilities for testing and checking the heat, pour and finished casting.

THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • *Eastern Office:* 12 East 41st Street, New York 17, N.Y.

Detroit Office: 23906 Woodward Avenue • Pleasant Ridge, Mich.

Atlanta: J. M. TULL Metal & Supply Co. Chicago: F. O. NELSON 332 S. Michigan Avenue San Francisco: JOHN D. FENSTERMACHER 1241 Taylor Street

METAL GOODS CORP.: Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

PROGRESS: What's

Discuss future possibilities in atomic power, heating homes with pumps, turbine progress.

Is an atomic power plant economically practical? Can you heat a home with a pump? Is the steam boiler going obsolete?

The 2400 members of the American Power Conference had a field day in Chicago last week discussing these and other important questions. Their interest was focused on atomic energy, air conditioning, the gas turbine, national water resources, and hydroelectric power on the St. Lawrence River.

Atomic Power Entry

They learned that commercial atomic power would arrive in from 5 to 10 years—or about 4 or 5 years after it's decided to build such a plant. Fuel would be U235 and U238. The plant will be liquid cooled with heavy water under pressure or liquid metal. Cooling tubes and other internal parts would be made of zirconium or stainless steel. (See p. 111 for Washington pressure to use commercial atomic power.)

Air conditioning received considerable attention (see Special Report on p. 89). Discussed was the heat pump, which can heat a home in the winter and cool it in the summer. At St. Louis an experimental unit using 600 ft of ⅞ in. copper tubing and carrying a refrigerant solution was buried 4 ft underground. It picked up enough heat to warm a 7-room house.

Draws Heat from Air

Also discussed was a pump which drew heat from air but which needed booster heating in the winter. At least 11 such installations were described as successful. The heat pump has been kept under close study by appliance and air conditioning manufacturers.

Steam turbine electric generators have kept pace with other advances in the power engineering field. Today's generator can pro-

Up In Atoms, Heating

duce 220,000 kva on 3600 rpm machines, 245,000 kva on 1800 rpm machines, or 465,000 kva on the machines in tandem. A total of 45 generators are on order for 1953 in the classes of 180,000 kva, 220,000 kva, and 260,000 kva at 3600 rpm. Another four generators rated at 175,000 kva are on order in the 1800 rpm class.

Secret of the advance in power potentials of steam turbine generators has been careful control of carbon and chromium content in the rotor forgings, use of oriented-grain strip steel for magnetic parts, cold-worked silver-bearing copper in the rotor windings, Cond-Al for rotor windings. The end result: stronger materials of better characteristics, larger size, more power.

In a Texas utility, a gas turbine-generator proved competitive with steam generators. Natural gas from Texas fields is delivered from a compressor at 160 psig.

Solve Some Problems

Natural gas and distillate oils give no great difficulty in gas turbines, here or abroad, but residual oil requires close maintenance. An end for some gas turbine problems seems already in sight. British turbine installations fired with residual oils have eliminated a great deal of corrosion by controlling fuel atomization. Selected grades of residual oil can already be burned satisfactorily.

One writer regarded gas turbines for coal firing as needing several years development. Mentioning the use of by-product fuels, it was pointed out that blast furnace gas is already being used, and coke oven gas, chemical wastes, are possible. Even sawdust is under consideration.

Importance of heat as well as friction in pulverizing coal particles for use in pulverized coal fired boilers is growing.

And water resources are being wasted. Several means of meeting increasing water shortages have been suggested.

AMES

No. 2
Dial Comparator

This is smallest in the Ames' line of high quality dial comparators and it is ideal for desk or bench use in the fine inspection of small precision parts. It is light in weight, but its broad base makes it very stable. The capacity approximates that of the regularly supplied Ames No. 202 Dial Indicator which has a dial numbered 0-100, graduated in .001" and with a .250" range. Should your job requirements differ, you can have the No. 2 with any Ames "Hundred Series" Dial Indicator. Send for Ames Catalog No. 58 covering the entire line of Ames Top Quality measuring instruments or, better still, send complete details of your Quality Control problem. Ames will suggest a solution – no obligation, of course.

Ames Long Range Dial Indicator No. 2822

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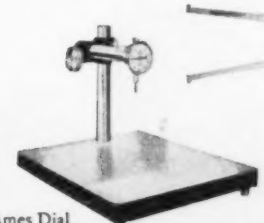

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SAE MEETING: Focus on Better Output

Ways to improve production and cut costs dominate engineer's meeting . . . Radio-equipped fork trucks hailed . . . Increased use of cold forgings predicted—*By R. D. Raddant.*

How to improve production, lower costs and improve quality were the dominant themes at the Society of Automotive Engineers' National Production Meeting and Forum in Cleveland last week.

Most of the 500 engineers participating in the eight forums, four technical sessions and plant tours were concerned about: (1) How to improve plant production, and (2) how to lower production costs without sacrificing quality.

Set Quality Limits

One conclusion arrived at during an opening panel session was that plants are becoming aware that they must set limits on quality that are compatible with the product. Also observed was a growing trend to evaluate suppliers in terms of quality control.

An extreme illustration was the claim by one engineer that his plant paid no invoices on new machinery until the equipment proved itself on his own company's quality control charts.

Standardized Production

At the production control forum, two views were expressed on tabulating systems. Panel's conclusion: Tabulating systems will pay for themselves if production is sufficient to offset costs, and if the products are standardized to the extent that they can be translated into punch cards.

A hot debate on the use or abuse of fork trucks in hauling, highlighted the materials handling session. A growing trend toward radio-equipped fork trucks was noted. With operation controlled by a central dispatcher, it is possible with the radio-equipped trucks to eliminate empty trips and to expedite handling.

Use of pallets was discussed at length and it was brought out that automotive materials handling engineers have obtained better than 25 pct freight reductions in some cases in returning collapsible pallets.

Materials handlers were advised that it is important to package finished products attractively to increase sales appeal. This feature should not be overlooked in concentrating on handling and breakage.

Major surprise of the foundry session was the lack of interest in shell molding, which was expected to consume most discussion time. It was the consensus of the panel and panel audience that the basic value of shell molding to date has been in stimulating green sand foundrymen to improve quality.

The panel recommended closer liaison between the engineer who uses or designs the part and the foundry itself. Too often this is left entirely in the hands of procurement which frequently does not understand what is required.

In the future the forging panel said there will be more and more cold forgings, increased automation in hot work, and use of other automatic forging machines, including wider application of single blow machines.

During the grinding and cutting tool discussions it was agreed that mists and vapors can improve tool life, but often result in conditions around the machine that made their use impractical.

Maintenance More Important

The preventive maintenance talk concentrated on scheduling maintenance to obtain longer life and cut production downtime. Alert preventive maintenance consists of revising schedules to obtain the longest period of operation weighed against the possibility of breakdown. This is increasingly important in transfer machines of the modern automated plant.

Talks on progressive assembly technique were dominated by personnel problems such as pay and absenteeism. This may indicate that techniques of progressive assembly have reached maturity and that labor is now the top problem.

In a technical paper, D. S. Harder, Ford vice-president of manufacturing, weighed the advantages of automation against the disadvantages of high maintenance engineering, installation and specialized operation costs and warned that "no industry can afford not to consider its possibilities."

H. H. Whittingham, of the Detroit Gear Div. of Borg-Warner Corp., characterized automatic transmissions as the most complicated pieces of mechanism in the modern automobile. Their conditions of manufacture require unusual cleanliness.

MATERIALS HANDLING panel at SAE Meeting discussed ways to improve movement of materials. From left: S. Sanders, Leece-Neville Co.; H. Diefendorf, A. D. Horning-Chrysler Corp.; D. Kelsey, Union Steel Products; A. Blatz, A. O. Smith Corp., A. Hancox, Cleveland Graphite & Bronze Co.

MACHINERY: Farm Sales Drying Up?

Spring buying surge spotty, comes late . . . Distributors have heavy inventory . . . Several firms see 10 pct production slip from '52 . . . No alarmist fears in industry—*By K. W. Bennett.*

For many farm machinery dealers the traditional spring buying surge is arriving sporadically or late this year. At the distributor level, machinery is stacked too thickly in inventory and some large producers report they have lowered production 10 pct since the year began.

Retail sales for the first 2 months of '53 had registered a 27 pct drop from the same period last year. Producers of equipment had cut back 19 pct from 1952—a year when sales had slipped. And several concerns were predicting that sales in 1953 would drop 10 pct from last year.

Flatten Backlogs

Sleek backlogs of orders from farmers seeking to replace equipment worn out during World War II and from the Korea buying spurt have flattened. The omens for future business volume seemed unkind but no alarmist fears had been raised in the industry. Some manufacturers muttered something about returning to "normal business levels."

Suppliers of specialty goods to the equipment builders report business volume developing some unseasonal holes. Usually, farm equipment builders will lower their purchasing rate in April and wait for the fall market in harvesting equipment.

This year the purchasing agent is making few, if any commitments beyond April, preferring to wait, gage the midyear market tempo, before he loads his inventory with expensive specialty items. His pressure for raw steel is strong on the mills, but he's not interested in conversion, has little taste for foreign steel in any appreciable amounts.

From the farm equipment distributor come two cross currents of opinion. One group positively predicts a good selling year. Reflecting the producer frame of mind, a second group makes no show of enthusiasm but is quietly rolling its sleeves and getting ready to fight for a House bill allowing federal loans to finance farm equipment purchases.

One phase of this is soil conservation. The farmer who seeks to improve his farm by terracing, for instance, would be elegible for Federal loans to cover purchase of equipment needed to keep up improved land.

With scattered exceptions, the delivery picture is good from the consumer standpoint. One large Midwestern firm reports its light tractor slow in delivery, with a 2-month backlog of orders, while heavy tractors are immediately available. This reverses completely last year's spring delivery picture. Another firm reports deliveries of tractors have climbed in the last 6 weeks over the '52 rate. But this report seems the exception.

Generally, heavy tractors are slow in delivery, lights are delivered quickly. A third large producer has both lights and heavies for immediate delivery. This illustrates the farmer's growing preference for certain tractor types bearing certain brand names.

In procuring materials, the farm equipment producer still has to struggle on some items. But that inventories are increasing is evident from the cutoff of major bar conversion arrangements last month and decreasing interest in conversion steel generally since first quarter. Farm equipment makers must hunt out cold-rolled and hot-rolled sheet and strip.

Blame for the sales decline was put with varying emphasis on tighter farm credit, a drop in crop prices, and the cut in 1953 buying power by the '52 drought.

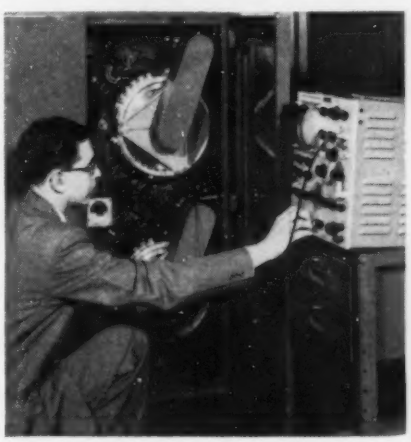
Brains Come Off Assembly Line

Newest addition to the giant "brain" family, International Business Machine Corp.'s model 701 electronic calculator, was installed at the company's New York headquarters last week. It is said to be the first calculator of its size to be manufactured on a production-line basis.

Successor to IBM's Selective Service Electronic Calculator, the 701 is reported to be 25 times as fast as the earlier model while only one-quarter its size. In solving a typical problem, the calculator can perform 14,000 mathematical operations in a second.

Designed primarily for scientific and research purposes, all 12 or more calculators which IBM plans to build at its Poughkeepsie, N. Y., plant this year will be consigned to defense industries or government agencies. The calculators will rent for $11,900 or more per month.

Employing all three of the most advanced electronic storage memory devices, the 701 has cathode ray tubes, magnetic drums and magnetic tapes.



MEMORY SECTION of IBM's new electronic computer stores over 80,000 digits.

PRIORITIES:

NPA speeds actions in shift from CMP to DMS . . Clip some DO ratings.

While the Capehart (Senate Banking) Committee listened to opinions on controls legislation, National Production Authority last week clipped more red tape looking to transition of CMP to DMS.

Keenly aware of trends, NPA moved ahead at a fair rate in revising and revoking orders to bring about "orderly decontrol" and to provide for military needs under the newly-established Defense Materials System.

Horace B. McCoy, acting NPA administrator, said that all actions being taken are on the assumption that Congress will extend the Defense Production Act largely along lines recommended last week by the White House.

This would automatically give official status to DMS. Under the set-up outlined by McCoy last week, virtually all materials controls would be dropped June 30, except those needed to keep military needs filled.

Cancel DO Ratings

Several actions were taken by the agency during the past week. It formally cancelled all DO rating authority, effective July 1, except those used by military and atomic energy producers.

But the agency made clear, in Amend. 20, CMP Reg. 1, that earlier authorization to the steel industry to accept unrated orders above military requirements did not include nickel bearing stainless.

NPA also made changes in priority rules for Canadian producers to bring them into line with DMS regulations after the second quarter.

At the same time, NPA dropped a special order which had required specified tin can shredding plants to ship their output to copper producers.

Also revoked were restrictions on production of color television sets. The ban had been relaxed last year but revocation of M-90 completely lifts the lid.

However, set manufacturers are cool to the idea of plunging into mass color set production. Industry spokesmen in Washington last week indicated that production probably would not start until the Federal Communications Commission ruled on the merits of the so-called compatible system. This is claimed to have been highly developed since the agency had approved an earlier system prior to the freeze.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Repair parts for main and auxiliary turbine and reduction gears, 5738, $291,-263, Dravo Corp., Philadelphia.

Periscopic sextant, 1680, $3,128,315, Kollsman Instrument Corp., Elmhurst, N. Y.

Tachometer indicators, 743, $207,308, Kollsman Instrument Corp., Elmhurst, N. Y.

Searchlights less, q282, $1,396,165, The Strong Electric Corp., Toledo.

Oxygen cylinders, 3365, $98,561, Walter Kidde & Co., Inc., Belleville, N. J., *H. S. Klimaski.*

Shell, smoke, 25000, $1,230,300, Nesco, Inc., Milwaukee.

Plug, loading accessories, 2309000, $253,-990, Monroe City Diecasting, Monroe City, Mo.

Fuze, 1000000, $8,822,000, U. S. Time Corp., Middlebury, Conn., *Edward Hull.*

Replenishment of other motor vehicle parts, 12000, $256,560, Columbus McKinon Chain Corp., Tonawanda, N. Y.

Replenishment of motor vehicle parts, 3800, $71,820, Ainsworth Mfg. Corp., Detroit.

Replenishment of small arms parts, 9400, $543,884, Saginaw Products Corp., Saginaw, Mich.

Replenishment of tank & combat vehicle parts, 75350, $79,449, Wagner Electric Corp., St. Louis.

Replenishment of small arms parts, 18500, $70,614, Automotive Mfg. Co., Chicago.

Replenishment of small arms parts, 2600, $77,376, Hercules Engineering & Mfg. Co., Detroit.

Generator, steam, 50, $80,731, Orr & Sembower, Inc., Reading, Pa.

Extinguisher, fire, 5512, $61,128, Elkhart Brass Mfg. Co., Inc., Elkhart, Ind.

Spare parts for service unit, flamethrower, var, $86,689, Davey Compressor, Kent, Ohio.

Case, cartridge, 235000, $1,128,000, Globe American Corp., Kokomo, Ind.

Generators, 1400, $264,208, Bendix Aviation Corp., Teterboro, N. J.

Kit, repair differential, 7000, $98,350, Studebaker Corp., South Bend, Ind.

Case, cartridge, brass, 7105886, $1,356,-513, Nesco Inc., Milwaukee.

Fuze, 16000 units $462,000, Chicago Electric Co., Chicago.

Case cartridge, 76 MM, 800000, $2,907,-360, Ekco Products Co., Chicago.

Primer, percussion, 1889000, $55,910, Harper Wyman Co., Chicago.

Fuze, 20000, $94,800, Borg Products Div., Delavau, Wis.

Inverters, rotary, 2560, $325,370, Redmond Co., Inc., Owosso, Mich.

Gun, 90 MM, 501, $886,273, General Motors Corp., Lansing, Mich., *A. E. Goosen.*

Shells, 422844, $3,120,045, Minneapolis-Moline Co., Minneapolis.

Bearings, 44500, $80,545, The Barden Corp., Danbury, Conn.

Generators, 3089, $1,352,349, Bendix Aviation Corp., Teterboro, N. J.

Intervalometers, 1996, $1,266,638, Abrams Instrument Corp., Lansing, Mich.

Pressure gages, 4619, $206,838, American Machine & Metals, Inc., Sellersville, Pa.

Generator, 6029, $162,896, Jack & Heintz, Inc., Cleveland.

Link, metallic belt, 5000000, $216,650, Autoyre Co., Oakville, Conn.

Revolvers, 8901, $346,515, Colt's Mfg. Co., Hartford, Conn.

Revolvers, 3684, $137,354, Smith & Wesson, Springfield, Mass.

Rooster, 963000 ea, $895,590, Screw Machine Products Co., Portland, Ore.

Mine, 293000 ea, $316,029, Tacoma Metals Products Co., Inc., Tacoma, Wash.

Booster, 1300000 ea, $1,199,120, Weight, Albert, Emeryville, Calif.

Reel assy, 6000, $107,520, Parrish Presses Steel, Reading, Pa.

Aircraft panel clocks, 3303, $83,542, Waltham Watch Co., Waltham, Mass.

—Construction—

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

850 Tons, bridge at Albany project. 55-3-3 awarded to Ernest Ironworks.

825 Tons, Amesbury and Salisbury, Mass., five bridges and bituminous concrete limited access road. A. V. Taurasi, Inc., Somerville, low bidder.

800 Tons, for warehouse at Twin City Arsenal at Minneapolis, awarded to American Bridge Co.

345 Tons, Merrimack, N. H., 3 ton continuous steel girder bridge. E. D. Swett, Manchester, N. H., low bidder.

300 Tons, Corps of Engineers for Twin City Arsenal at Minneapolis, awarded to St. Paul Foundry.

250 Tons, for bridge in Fond du Lac County, Wis., project FO3-1/36, awarded to Milwaukee Bridge Co.

200 Tons, Socony Vacuum Co. engineering building at Chicago to American Bridge Co.

Reinforcing bar awards this week include the following:

291 Tons, Amesbury and Salisbury, Mass., five bridges and bituminous concrete limited access road. A. V. Taurasi, Inc., Somerville, Mass., low bidder.

Fabricated steel inquiries this week include the following:

2000 Tons, for St. Marys Hospital, Evansville, Ind.

1350 Tons, for highway bridge at Jefferson City, Mo.

if you do ANY of these jobs . . .

you need this jack-of -All-jobs . . .

No. 7 Combination Shear, Punch and Coper

the Kling COMBINATION SHEAR-PUNCH-COPER

Remember, when you were a boy, what a hit that 6- or 7-blade jack-knife made? You could do just about everything with it!

This Kling Combination Shear, Punch and Coper will make an equally big hit in your shop. It does any of the jobs shown above, and a lot more. It can turn out the same work as a separate punch, angle shear, bar shear, plate shear and notcher. Best of all, it costs only a few dollars more than a single-purpose punch.

To gain maximum speed and safety, each end operates independently. Foot pedals allow operators to keep hands free to hold work.

In shops of every size, the Kling Combination is speeding production, reducing man-hours, and increasing profits on metal-working jobs. Investigate what it can do for you. Available in 3 sizes, for light, medium and heavy work. Ruggedly built, and meets machine tool precision standards.

Write for latest FREE *Bulletin No. 347. Gives complete details of jobs this Machine can handle; also capacities, other technical data and specifications.*

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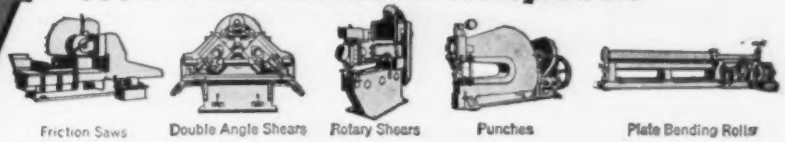

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It's a tough one to machine

Trip Plate for high speed industrial sewing machine material: Alloy Steel, SAE 8620 Overall length 2½".

but comes out right as a Precision Investment Casting

The machining time required to produce such parts as above illustrated often makes complete costly re-designing of functional parts necessary.

Not so with EpCo precision investment castings because all of these "tough to machine" features are cast with ease and economy.

Often re-designing by EpCo, where permissible, can make these castings even more economical, too—but the close tolerances and the little or no machine finishing required, when you specify EpCo castings, makes it good business to investigate this means of producing your delicate and difficult parts in practically any metal.

Send a drawing or sample of your "tough to machine" parts for the expert opinion of our engineers on castability, NOW.

EpCo

ENGINEERED PRECISION CASTING CO.

MATAWAN — FREEHOLD ROAD
MORGANVILLE, NEW JERSEY

Industrial Briefs

At Your Service . . . BENJAMIN LASSMAN & SON has opened its new plant and offices in suburban Pittsburgh, Route 8, Glenshaw, Pa.

New Rep . . . HANNA ENGINEERING WORKS, Chicago, has appointed Barton Sales Co. its new sales representative in the northern Indiana territory.

Going Up . . . HAMMOND IRON WORKS has reported that construction has started on a new $1 million plant in Birmingham. Allied-Benes Corp. is general contractor.

Relocated . . . THE PERMUTIT CO. has moved its sales office in Los Angeles to a new location at 302-B South Brand Blvd., Glendale, Calif.

New Prexy . . . AMERICAN SOCIETY OF TOOL ENGINEERS, Detroit, has elected Roger F. Waindle, vice-president of the Cannon-Muskegon Corp., of Muskegon, Mich. its president.

Opportunity Knock . . . The 1953 AMERICAN GAS ASSN. Industrial Gas School will be held on May 4-8 in the Sheraton-Cadillac Hotel, Detroit. This course is open to men who sell or promote gas for industrial processing operations.

New Plan . . . CARBOLOY DEPT. of General Electric Co. has a new carbide inventory plan which is designed to reduce single point tool stocks as much as one third. Key to the plan is the use of low cost standard tools in place of the many "specials" many companies now employ.

New Company . . . BIRMINGHAM PRODUCTS CO., Birmingham, has been formed to manufacture heaters for the Air Force.

Research Unit . . . AIR PRODUCTS INC., started another step in its long-range building program when ground was broken for the first unit of a research laboratory in Allentown, Pa., recently.

New Quarters . . . RAYBESTOS-MANHATTAN, INC., has moved from 445 Lake Shore Drive, Chicago, into its newly constructed office and warehouse building at 6010 Northwest Highway.

Flying High . . . ROCKWELL MFG. CO., Pittsburgh, has a new seven-passenger S-55 Sikorsky helicopter that is helping the company solve its transportation problems between its main offices in Pittsburgh and seven plants within an approximate 200-mile radius.

Expanding . . . LINDBERG STEEL TREATING CO. reports a $2 million expansion program which will include a new 100,000-sq-ft plant now under construction on a 6-acre tract of land at 1975 N. Ruby St., Melrose Park, Chicago.

Coming Up . . . WORLD TRADE WEEK will be observed nationally during the week of May 17-23, coinciding with the traditional observance of National Maritime Day on May 22, the Chamber of Commerce of the United States has announced.

New Warehouse . . . BRIDGEPORT BRASS CO. is moving its New England warehouse facilities at Providence to a new and larger location at 177 Georgia Ave. N. Newbury will be in charge of the new warehouse.

Canadian Rep . . . CONTINENTAL EQUIPMENT CO., Coraopolis, Pa., has appointed The Peerless Brothers Agencies, Ltd. its Canadian representatives.

Elected . . . Joseph H. Field, manager of the Steel Window & Door Dept., CECO STEEL PRODUCTS CORP., Chicago, has been elected chairman of the board of directors of the Steel Window Institute.

Miami Branch . . . KURT ORBAN CO., INC., has opened a Miami branch at 1816 20th St., Miami Beach, Fla., with Arthur Nichols in charge.

Efficiency . . . THE NATIONAL SUPPLY CO. reports that a record of drilling 101 oil wells, averaging 2671 ft deep, in 608 days has been established by a rotary rig operated by Rex & Morris, Eldorado, Kan. The rig, an Ideal Type T-25, was made by the National Supply Co.

Editor's Preview . . . NORTON CO., Worcester, Mass., took the wraps off the new $6 million expansion of its Grinding Machine Div., this week when editors of newspapers and technical magazines toured the plant.

Specify

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HIGH-TENSILE STEEL

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N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections —resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made lighter in weight . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

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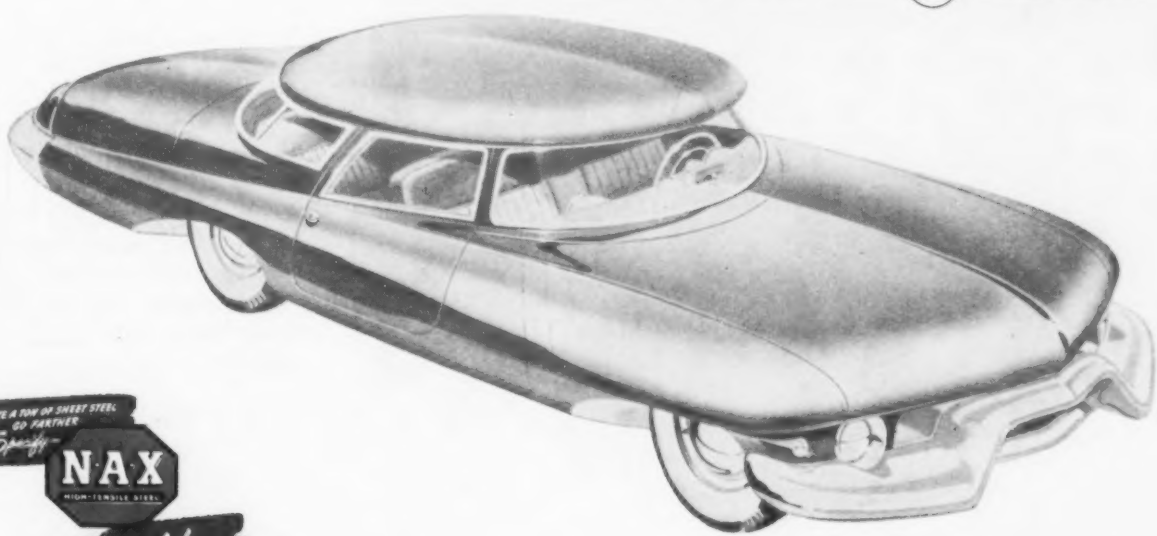
NATIONAL STEEL CORPORATION



MAKE A TON OF SHEET STEEL GO FARTHER
Specify N·A·X HIGH-TENSILE STEEL
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KEEP YOUR SCRAP MOVING TO YOUR DEALER

Hot Stuff Helps Build Better Cars

Ford lab uses radioactive materials for delicate measurements . . . Adopt atomic energy to civilian use . . . Many tests not possible by conventional methods—By *R. D. Raddant.*

Ford engineers are getting valuable help these days from sensitive measurements taken at the company's radioactive isotope laboratory.

Part of Ford's new Dearborn Research & Engineering Center, the "tracers" lab is hitting paydirt in its program of adopting atomic energy to civilian use.

Where They're Used . . . Head of the small staff of technicians is Arthur Smith, Oak Ridge trained engineer. In Mr. Smith's words, "Our mission is to find out where radioactive isotopes can be used in making engineering measurements that are necessary for the development of a better automobile."

An easy-to-explain example of this research is measurement of wear on standard piston rings. After cooking in a government atomic pile, a radioactive test ring is placed in a standard stock car engine and given a short test run. Engine oil is then drained and checked with a Geiger counter. Counter readings show how much material wore off the radioactive ring during the test run.

Rotating Rings . . . Faster and more accurate than the old method of before-and-after weighing of the test part, this technique also saves dismantling the engine.

Ford scientists have found another use for "hot stuff" in measuring piston ring rotation. Previously impossible by ordinary methods, it is now done by tagging a spot on the ring with a bit of radioactive cobalt wire.

Use Results . . . Geiger counters on opposite sides of the ring trace its motion. This process is now routine, and results have been passed on to auto engineers for evaluation.

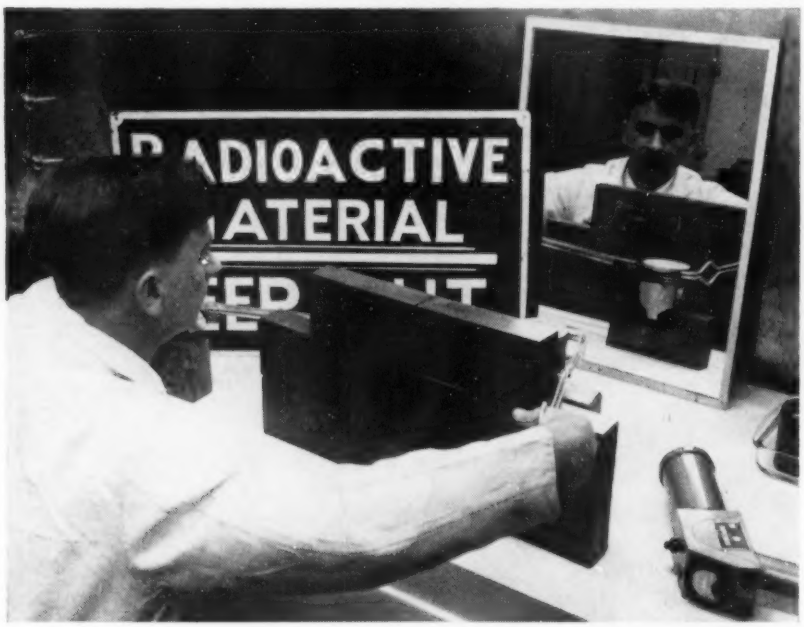
The lab staff has also found a way to measure airflow electronically. Radioactive material ionizes the air, which then passes through an electric field "collector" which registers the ionization and measures airflow. This method is now used in carburetor research to measure airflow into car engines.

Check Your Oil? . . . Researchers are now trying to measure oil consumption. Idea is to "contaminate" engine oil with radioactive cobalt and then measure the radioactivity of the exhaust. Object is to provide rapid and continuous measurement of oil consumption while the engine is running under different loads and conditions.

Oil consumption is traditionally computed by weight. This takes time and obviously doesn't have the advantages of fast and continuous measurement. The radioactive process is not yet perfected, however.

An additional field may be in the combustion chamber, one of the industry's big mysteries. Radioactive tracers are not the answer for optical instrumentation of what goes on in the combustion chamber, but may be valuable in determining the origin of combustion deposits.

Safety First . . . Most radioactive materials for the laboratory are shipped for Ford from the atomic pile at Oak Ridge, Tenn. Radioactive piston rings, for example, are shipped in a lead box weighing 100 lb.



RADIOACTIVE piston rings are manipulated behind lead bricks with the help of mirrors by Arthur Smith, Ford research engineer.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Mar. 28, 1953	146,403*	33,756*
Mar. 21, 1953	136,300	33,623
Mar. 22, 1952	101,776	31,074
Mar. 15, 1952	96,063	29,184

*Estimated Source: *Ward's Reports*

MERGER: K-F, Willys Take Vows

Stockholder approval practically assured on deal . . . Will Big Three become Big Four? . . . Industry balks at imitating Chrysler price cuts . . . UAW contract threat inevitable.

Last week may have been one of the biggest of the year in the auto industry as developments of tremendous importance unfolded on three fronts.

They are the practically assured purchase of Willys-Overland by Kaiser-Frazer, price cuts by Chrysler averaging $100, and decision of United Automobile Workers to limit future contracts to 2 years unless auto companies meet certain demands.

Make It Big Four?

The Kaiser-Frazer merger was under consideration for so long that final plans were an anticlimax. But joining of these two independents could possibly change the Big Three into the Big Four and revise the entire automobile picture. Willys stockholders still must approve the plans.

In brief, details of the transaction include:

Payment to Willys of $62.3 million for plants, inventories and manufacturing facilities. Manufacture and sale of Willys products will be carried on uninterruptedly by the purchasing corporation, which will be called Willys Motors Corp. with headquarters in Willys' hometown of Toledo.

Will Repay RFC

At the same time, K-F announced it will reduce its loans from Reconstruction Finance Corp. by $15 million. K-F will finance the transaction by private capital totalling $72.6 million. RFC loans to K-F reached $66,146,000, were reduced to $48,417,000 as of last Feb. 28.

Edgar F. Kaiser, K-F's president, emphasized that the purchase will not affect the operation of the independent organizations of the new company in production or sales.

Chrysler's decision to lop about $100 from its prices was followed by "hold the line" statements from competitors. Wholesale following suit is not expected. A great deal depends on sales in the next few weeks. If a reluctance to buy is evident, others will cut prices in spite of current denials.

It was observed with some interest that the price of Chrysler stock slumped about three points after the price cuts were announced. This was in spite of the firm statement of L. L. Colbert, Chrysler president, that lower prices were made possible by greater quantity production.

"Since the first of this year, Chrysler Corp. has built 32 pct more automobiles and trucks than we were able to turn out in the corresponding period last year under government controls. With the spring selling season just beginning, current retail purchases from our dealers are already setting a pace more than 50 pct ahead of last year," Mr. Colbert said in his official statement.

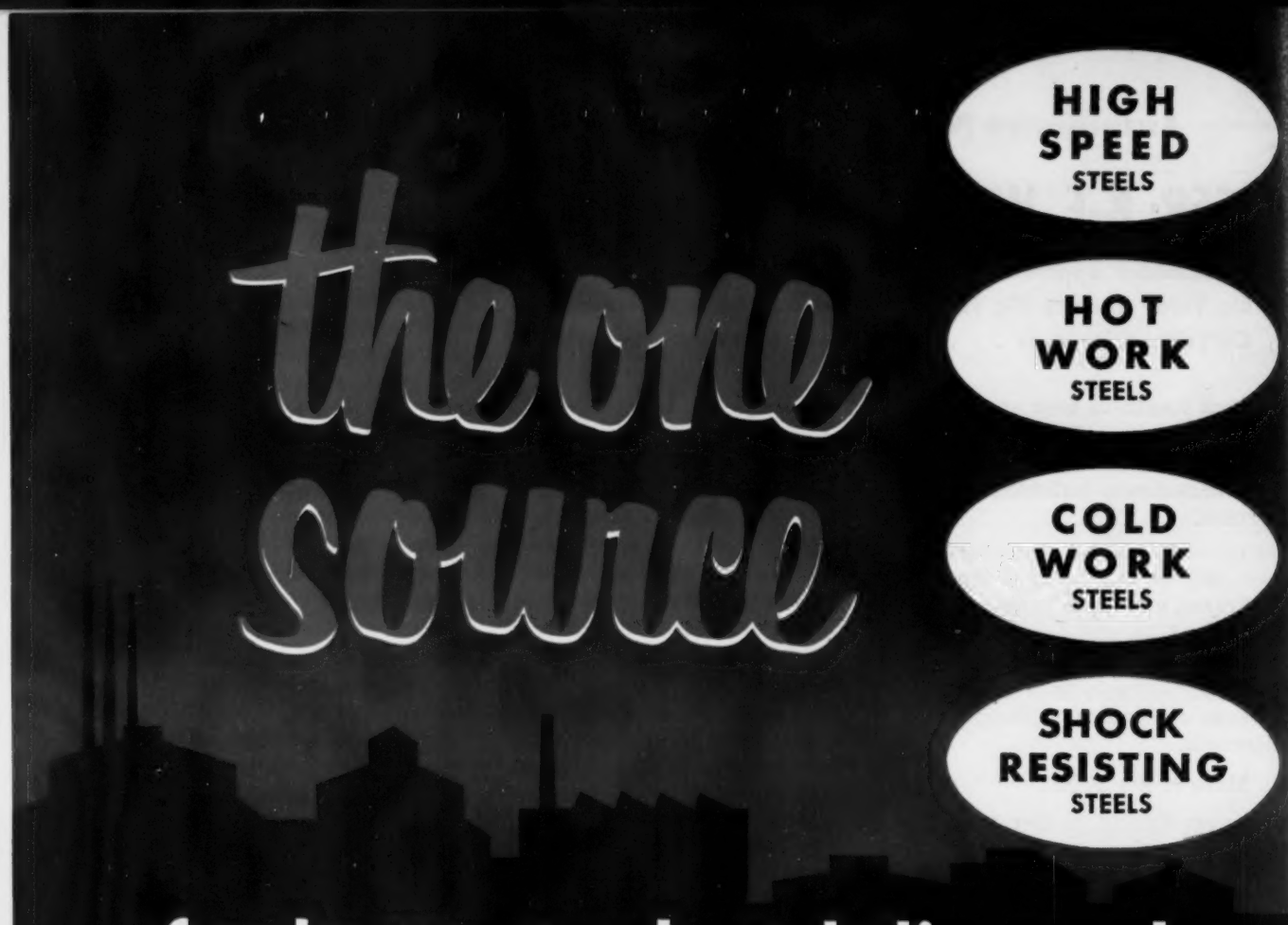
Third development, the UAW's threat not to renew current 5-year contracts with the auto companies, was also a foregone conclusion. Reluctance of automakers to renegotiate contracts at midpoint made this stand inevitable.

General Motors, however, had made a counter proposal to UAW demands, but it was rejected. The union did acknowledge GM's offer as "acceptance" of its contention that the 5-year contracts are "living documents."

The contracts, once hailed as opening a new era in industrial labor relations, had soured on UAW officials about half way through their terms. The UAW contends that unpredicted economic conditions (obviously those brought on by the Korean conflict) justified opening contracts. Apparently the "new era" lasted only to the first rough spot.

THE BULL OF THE WOODS — By J. R. Williams

I GOT MYSELF IN AN AWFUL MESS BY NOTICIN' THAT CHALK MARK! TH' GUY'S AWAY AND I'M AFRAID TH' CUT'LL RUN PAST IT AN' RUIN HIS JOB!
YOU GOT ME INTO IT NOW! IF WE SHUT IT OFF HE MAY BAWL US OUT FER MEDDLIN' IN HIS JOB, AN' IF ~~
AN' I HADDA STICK MY SNOOT IN! NOW IF WE DON'T SHUT IT OFF AN' TH' JOB'S RUINED, HE'LL SAY WE'RE STINKERS! OH, WHERE IS HE?
4-3
J.R.WILLIAMS
THE QUESTION MARK
T. M. Reg. U. S. Pat. Off.
Copr. 1953 by NEA Service, Inc.



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LATROBE . . . the one source that furnishes tool steel free of carbide segregation - whether you buy on mill order or from warehouse stocks . . . the only producer to offer disc inspection service to all tool steel users as a guarantee of the top quality you get on every order . . . the supplier who uses ultrasonic Reflectoscope inspection to assure you of internal soundness in the tool steel you purchase.

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Rails Ready to Buy Maintenance Steel

ICC estimates railroads have postponed $1 billion worth of maintenance work . . . Charge AEC lags on atomic power for industry . . . Probe inventory control of tools—*By G. H. Baker.*

There should be no lack of customers for steel rail and related steel track products, once the nation's railroads begin to make a dent in their $1 billion worth of deferred maintenance work.

New Interstate Commerce Commission estimates of postponed railroad maintenance projects place the total dollar volume of needed steel rail at $200,851,000, and the total dollar volume of other iron and steel track materials at $219,295,000.

Total estimate of $1 billion in deferred projects reflects only postponed maintenance expenditures. Deferred expenditures for "capital improvements," such as new locomotives and cars, are not included in the $1 billion ICC estimate of postponed projects.

Atomic Power Lags . . . Detailed and concrete proposals for development of atomic electricity plants by industry are about to be disclosed by the U. S. Atomic Energy Commission, Representative Carl Hinshaw, R., Calif., says.

Mr. Hinshaw and other members of Congress have charged that AEC has been "dragging its feet" in opening up the field of commercial and industrial atomic power. Speaking as a member of the Senate-House Committee on Atomic Energy, Mr. Hinshaw asks: "If we had not insisted, when would they have volunteered?"

Atomic development for industrial power has been too slow on both civilian and military areas, he contends, observing "socialism does not work in America."

Poor Inventory Control? . . . Congressional interest in management of the government's $6 billion stock of machine tools is perking up.

Upcoming House hearings (before an Armed Services subcommittee headed by Rep. Paul Shafer, R., Mich.) are expected to evaluate quality of tool inventory control by such government agencies as National Production Authority, Munitions Board, and General Services Administration.

Today, federal agencies hold title to about 500,000 production tools. More than 450,000 have been leased to defense and civilian contractors. About 50,000 tools are in storage.

No Coordination . . . Probers hint machine tools are being purchased when such equipment is already available in storage. Another case mentioned was one government agency buying and storing new equipment while other government agencies are trying to secure delivery of some identical items.

The agency which has the machines in storage is often refusing to agree to diversion from storage for projects of questionable urgency. And there are other cases where two or more agencies place similar or identical orders, thereby extending deliveries over periods of many months, it's said.

These are the first rumblings.

"First they deferred the men now they've deferred the project."

Get Tough on Draft . . . Loss of industry's younger wage-earners to military service is to continue, despite Defense Secretary Wilson's good intentions to trim Army, Navy, and Air Force payrolls. The reason: Even with the services at "partial mobilization" levels, Selective Service officials have just about reached the bottom of the manpower barrel.

Only immediate solution, as Selective Service headquarters sees it: (1) Start calling up 19-year-olds, (2) get tough about deferments (this will hit industry), (3) ask Congress to stretch out the present 24-month period of military service to 30 months—possibly even to 36 months.

Drop Ship Workers . . . Further cut-backs in civilian employment rolls of the Defense Dept. are in the works. Navy has decided to lop 3000 shipyard workers from its payroll by Mar. 31.

This means a reduction to 134,000 of the total 137,000 shipyard workers employed today. Ten shipyards in the U. S. and one in Hawaii will be affected.

AEC Strike Safeguard . . . Principal job of the new Atomic Energy Labor-Management Relations Panel will be to insure that employer-employee disputes will not endanger the U. S. nuclear energy program.

When customary techniques have been "fully utilized" and continuation of a dispute is, in the belief of Atomic Energy Commission, threatening atomic energy operations, the panel will take over.

FOR ALL YOUR BRICKLAYING JOBS

Armstrong's C199 Cement is an all-purpose, air-setting refractory mortar. You can use it on all types of fire clay brick and insulating refractories. It can also be applied by brush or spray gun as a protective facing on brick furnace linings.

By standardizing on C199 Cement, you can cut down inventory and purchase in more economical quantities. Armstrong's C199 Cement produces joints that are stronger than the brick it bonds!

For Armstrong's C199 is formulated without the usual bonding and plasticizing agents that cause ordinary mortars to crack, shrink, and rupture refractory surfaces. C199 takes a firm set at room temperatures and maintains this strength up to 2910°F.

C199 offers practical advantages on the job, too. It's easy to handle, has high plasticity, and can be troweled directly from the drum.

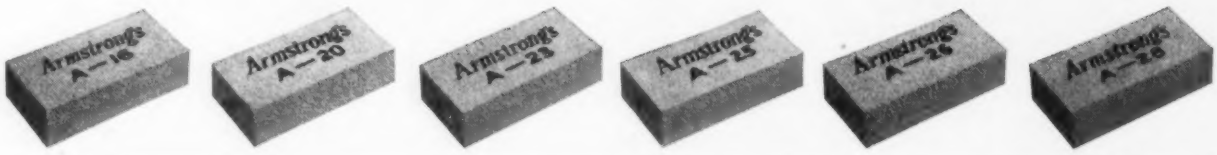
Full information on C199 is given in the booklet, "Armstrong's Insulating Fire Brick and Refractory Cements." For your copy, just contact your near-by Armstrong office or write Armstrong Cork Company, 4904 Mulberry St., Lancaster, Penna.

EASY TO HANDLE

Masons like to work with C199. Even after months of storage, it pours readily. Its high moisture retention allows bricks to be spread well ahead of the mason. It thins easily to dip joint consistency.

UP TO 2910°F.

This cement will not soften and run out of joints. It withstands abrasion, resists spalling. Meets A. S. T. M., American Refractories Institute, and Navy Standards for a super-duty mortar.



ARMSTRONG'S INSULATING REFRACTORIES

CONTROLS: Ike Won't Veto Freeze

White House wants all controls junked . . . Will accept 90-day freeze on wages, prices to give Congress time to act . . . Keep military priorities . . . Continue defense, business loans.

The White House wants all controls authority—except military and atomic energy priorities—thrown out of the proposed legislation for extending the Defense Production Act.

Standby power to freeze wages and prices for a 90-day period while Congress takes action on needed controls would be accepted by the Administration as a provison of the act—but is definitely not wanted. Standby controls legislation is not wanted at all.

This is the gist of detailed testimony by Arthur S. Flemming, acting director of the Office of Defense Mobilization, who went before the Senate Banking Committee last week as White House spokesman on controls legislation.

Dr. Flemming discussed in detail the provisions of the existing act with special emphasis on Title I which concerns materials controls legislation.

Continue Military Priorities

Authority for the government to allocate and issue military priorities should be continued under Title I for 1 year, it was stated. But no provision should be retained for allocating materials for civilian consumption.

In effect, this would make official the Defense Materials System in pretty much the form it was set up by National Production Authority (THE IRON AGE, Mar. 26, 1953, p. 83.) After military setasides, remaining basic materials would go on the open market.

Dr. Flemming said that machinery for wage adjustment (Title V) should be allowed to die on June 30 as well as condemnation and requisition authority. (Title II).

On the other hand, he said, provision should be made for extension of limited financial aid for defense purposes for the period of 1 year (Title III) as well as the authority for aiding small business (Title VII).

Price and wage controls now existing under Title IV should be dropped, Dr. Flemming recommended. It was the White House position that if Congress believed that temporary freeze authority is necessary the president would not veto it.

The Defense Dept. goes one step further in its recommendations. It wants extension of provisions in Sec. 708, which provide immunity from antitrust prosecution for members of industry participating with the government in voluntary agreements concerning defense matters.

This would be important also because some officials see such a provision smoothing the way for Commerce Dept's projected Office of Production which is destined to swallow up NPA later this year.

Marines Display Pint-Sized Jeep

Unveiled at Quantico, Va., last week was the "Mighty Mite," latest Marine Corps vehicle. Demonstration of the Tom Thumb jeep seemed to bear out claims that it can do almost everything but fly.

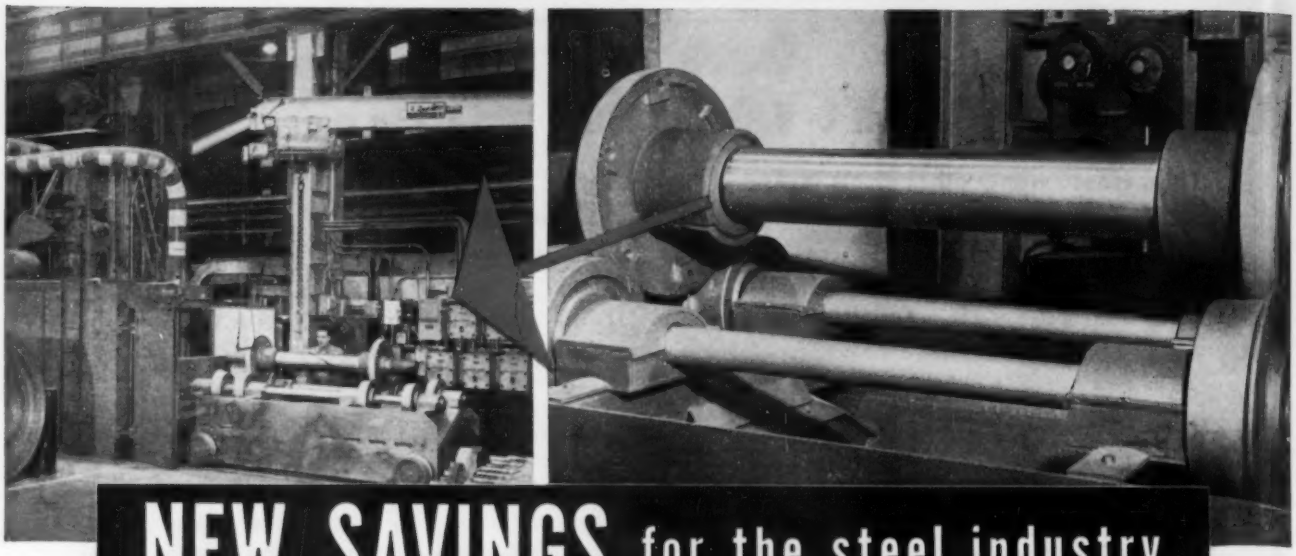
It can even fly with a little help from a helicopter. Brought into the demonstration area by 'copter, mites were taken over by 'copter-landed crews for wire-laying, 4.2 mortar carriers, and tow vehicles for multi-rocket launchers and a 105-mm recoilless rifle.

To top off the show, the mite scrambled through a sea of mud which left its big brother floundering—and plowed back into the muck to tow out the jeep.

The Mighty Mite (truck, utility, ¼-ton light weight) was perfected by a former Kansas City race driver, Ben Gregory. It will be produced by Mid-America Research Corp., Wheatland, Pa.

Powered by a 44-hp, aircooled Porsche engine, it has an all-wheel drive and can carry a 500-lb payload while towing an additional 1000 lb. It has a length of 8 ft, 8 in. as compared with the standard jeep's 11 ft, weighs only 1500 lb.

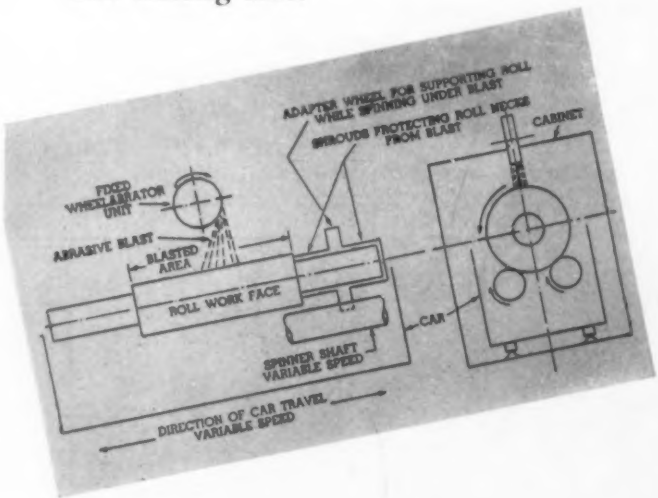
IRON AGE Washington Editors Karl Rannells (left) and Ray Stroupe inspect the Mighty Mite with 105-mm recoilless rifle at Quantico tests.



NEW SAVINGS for the steel industry

Etching mill rolls with the Airless WHEELABRATOR®

The Wheelabrator opens new horizons in cost-savings possibilities for steel mills in the etching of mill rolls used in temper mills. In a typical installation at the Weirton Steel Company, 8 to 9 inch diameter rolls are etched in just 54 seconds blasting time. Large 26 and 27 inch diameter rolls used in the cold mill, are etched in 3 minutes blasting time.



The diagram shows the airless Wheelabrator method of roll etching. This exclusive development conveys and rotates the work under a fixed and constant rectangular blast from the wheel.

PAYS FOR ITSELF THROUGH SAVINGS

Weirton previously roughened its temper mill rolls by passing emery paper between the rolls after installation in the mill. By eliminating use of emery paper for the initial etching of ground rolls, the Wheelabrator will more than pay for itself through savings in the cost of paper alone. Another big advantage is that it provides a better shape to the roll which means better gripping in the mill. Wheelabrating also provides an etch of a more uniform depth and texture which insures an improved surface on the steel sheet.

AN IMPROVEMENT OVER AIRBLASTING

The Wheelabrator roughens mill rolls in 1 to 3 minutes that commonly takes from 10 to 30 minutes in conventional airblast machines. It produces a uniform etch automatically at a greatly reduced cost per roll. It is a proved fact that rolls so etched have a materially increased life in the mill with a resulting increase in tons rolled per set of rolls.

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D-3578 **WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT**

Plan More Aluminum Fabrication

Northwest will process more of its white metal output . . . Alcoa will install two extrusion presses at Vancouver . . . Harvey buys alumina research plant—*By T. M. Rohan.*

Local northwest aluminum fabrication to utilize more of the area's heavy ingot production made another stride last week.

Aluminum Co. of America announced plans to install two extrusion presses at its Vancouver, Wash., plant. Cost will be $2.7 million, with construction scheduled to start in the near future.

Only Source . . . New facility will make Alcoa the only northwest production source for general extruded shapes. Colotrym Co. of Seattle started production last year but only for its own use.

The new 80,000-sq-ft extrusion plant will employ 200 and bring total Alcoa investment in fabricating facilities to $11 million with total employment of 2000.

Completion is expected in about 15 months. The plant will also be able to produce about 1500 tons per month of alloy blooms used in production of wire, rods and bars.

Buys Alumina Plant . . . In Los Angeles, Harvey Machine Co. completed final arrangements for purchase of the wartime Salem, Ore., alumina research plant to develop methods of exploiting local clay deposits.

The plant has been leased intermittently since the war to various firms for other purposes and will require extensive renovation. It has currently been idle since Dec. 1. Final settlement was for $325,000 or $25,000 over the original Harvey bid.

Harvey last week also got a $50-million contract for installation of four Air Force forging presses for aircraft wing spars. The first 8000-ton unit is due in February 1954 followed by 35,000, 25,000 and 20,000-ton units. Negotiations are also under way for 5500-ton German and British units.

Make Their Own? . . . California metal plants now supplying only minor components to western auto assembly plants are toying with expansion plans.

Firms which supply parts for eastern-made components such as engines, gears and axles are surveying possibilities of supplying forgings, castings and stampings for crankshafts, valves, etc., from western plants. This would take the load off midwest plants and help eliminate mounting railroad freight rates.

Bomber Output Climbs . . . The No. 1 U. S. bomber producer, Boeing at Seattle, this week is releasing its annual report on the biggest year in its history including World War II.

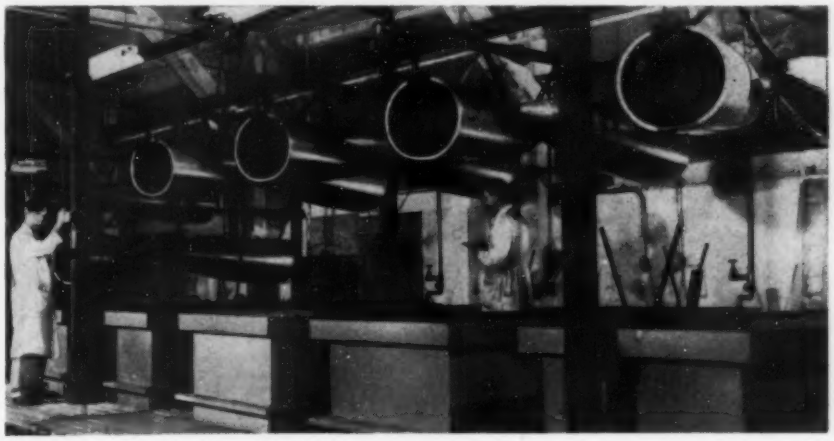
Total sales were $739 million, all to the Air Force, with net profit of $14 million or $8.67 per share. New facilities expenditures during the year were $6.5 million, bringing the 3-year figure to $22 million plus heavy government investment, mostly in machine tools.

Deliveries from the Seattle and Wichita, Kans., plants were at new but undisclosed postwar records at higher unit cost than during World War II.

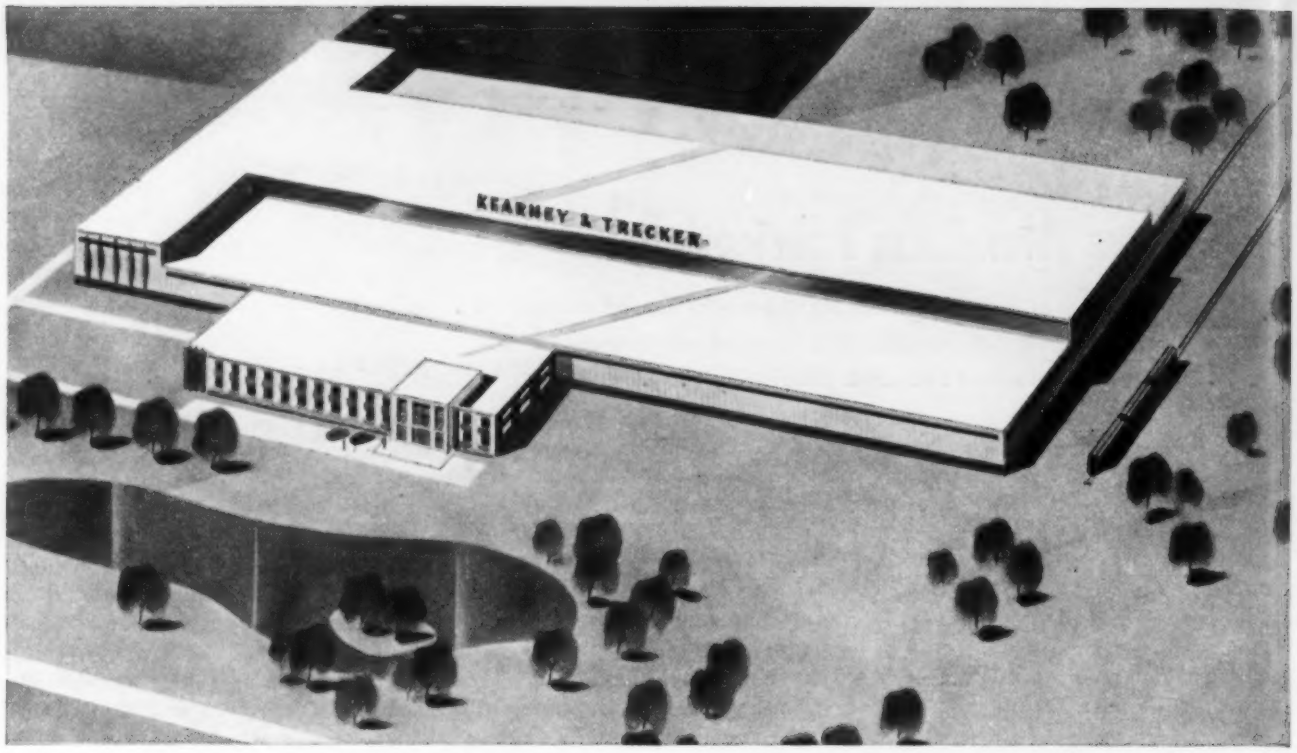
Still Growing . . . Los Angeles manufacturing employment last week was crowding the 600,000 figure of a total 1.8 million employment in the county. Industrial expansions for 1953 already total $27.6 million or nearly $10 million ahead of last year and $20 million over the same period in 1950 with an increase of 2138 jobs and $22 million annual payroll.

U. S. Bureau of Census reports released last week also showed California leading the nation in population growth with 804,000 in 2 years or net gain of 7.6 pct. The seven western states as a whole gained 7.6 pct.

A Deal? . . . Talks were going on last week in Los Angeles on possible merger of Lockheed and Hughes Aircraft. Lockheed currently purchases almost all electronics components from suppliers while Hughes production at the 350-acre Culver City plant is largely devoted to this.



CONVEYER DIPPING speeds output of jettisonable fuel tanks at Pastushin Aviation Corp., Los Angeles. Tank parts are immersed in five different anti-corrosion baths in 5 min.



Here it is! Kearney & Trecker's new Special Machinery Division — nearly 200,000 sq. ft. of new plant with new tools and equipment. An experienced, fully-staffed team of sales, engineering and production experts is ready and waiting to serve you . . . by engineering new production methods.

INCUBATOR . . . for Production Ideas

This plant is being built for you . . . to engineer *new* production methods — to build the large or small special machines, tools and fixtures you need to improve production and cut costs.

Production behind schedule?

Costs going up, up and up?

Will special machines, special tools and fixtures or special arrangements of standard machines help you solve these problems?

Then why not be among the first to take advantage of the 5-million-dollar-plus investment that Kearney & Trecker is making in new plant, new tools and new engineering to help you solve them.

Kearney & Trecker *is no newcomer* to the field of special machine tools and allied special equipment. During the past 50 years millions of dollars worth of Kearney & Trecker special machinery has been produced for plants all over the world. And that doesn't include the 60,000 standard Kearney & Trecker milling machines and other machine tools so well known and so widely accepted everywhere.

Kearney & Trecker is already working on new production ideas, new equipment and tool designs to be produced in this plant. Kearney & Trecker Special Engineering and Methods Analysts are ready right now to serve you with (1) Prompt response to your inquiry, (2) Immediate engineering help on your problem, plus, (3) The newest, finest and most complete facilities to build the special equipment you need — big or small.

Phone, write or wire The Special Machinery Division, Kearney & Trecker Corporation, Milwaukee 14, Wis., today. Get the facts about Kearney & Trecker's Special Machinery Division and how it can serve you.

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MACHINE TOOLS

It's Four Straight on Order Boosts

Nonrated demand pushes up new order index for fourth consecutive month . . . Cancellation rate, shipments both drop . . . Some builders doubt firmness of market—*By E. C. Beaudet.*

Machine tool market continues to show vigor, as the February increase on new orders marked the fourth straight month that new orders have risen.

Main reason for the upsurge is the increase in nonrated orders. With government controls on machine tools considerably relaxed, civilian buyers are taking advantage of the opportunity to modernize and expand production facilities in their plants.

Orders Mount . . . Preliminary new order index figure released by National Machine Tool Builders' Assn. for February was 282.2, an increase of 26 points from January. Shipments for February fell off slightly to 354.1 as compared with 361.6 in January.

Another encouraging sign is the drop in the cancellation rate. Some sources attribute this decline to the increase in civilian orders which are not dependent on the vagaries of military programs. Rate of cancellations is running about 10 pct as compared with 21 pct at the turn of the year.

Backlogs Hold . . . Industry backlogs still hover around the 9-month mark. If new orders continue at the same rate throughout the year, the industry may well do $900 million worth of business in 1953.

Some machine tool men expect a drop in new orders around mid-year but believe this will be offset by increased government buying toward the end of the year. In any case, the 9-month order backlog makes it almost certain that 1953 will be a good year.

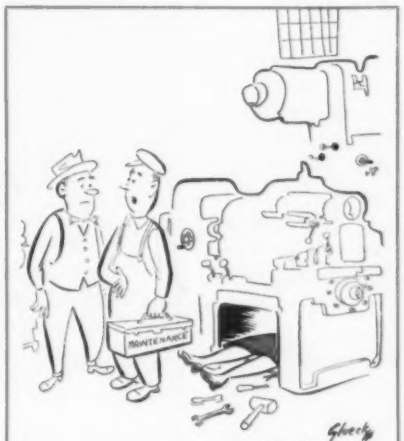
Doubt Firmness . . . In spite of rise in new orders, some builders still question the firmness of the market.

They regard the pickup as a result of a surge of confidence in industrial circles due to the change in administrations but are sticking by their forecast that the market will fall later in 1953 and all through 1954, before there is an upswing in mid- 1955.

Bearings Cost More . . . Recent increase of 10 pct in roller bearing prices reported by some builders is prompting speculation that machine tool prices may rise. But majority opinion is that competition within the industry will forestall any major increases.

Materials prices have not shown any tendency to run wild since controls were lifted. Castings which went up before ceilings were scrapped are in good supply and no price hikes are seen.

Labor is still the most critical factor. If a seventh round of wage hike takes place, builders may not be able to withstand the pressure of rising costs without raising prices.



"Turns out Watkins is a her and will brook no interference."

Display Improvements . . . Public showings of new facilities were held recently by two machine tool builders. Lodge & Shipley Co., Cincinnati, displayed its new 33,000 sq ft administration building. It is of functional design, is air-conditioned and has acoustical ceilings and asphalt-tile flooring throughout.

Decision to construct the building was made because of the need for increased manufacturing space inside the plant. Structural shapes, in short supply at the time of construction, prevented any addition to the plant.

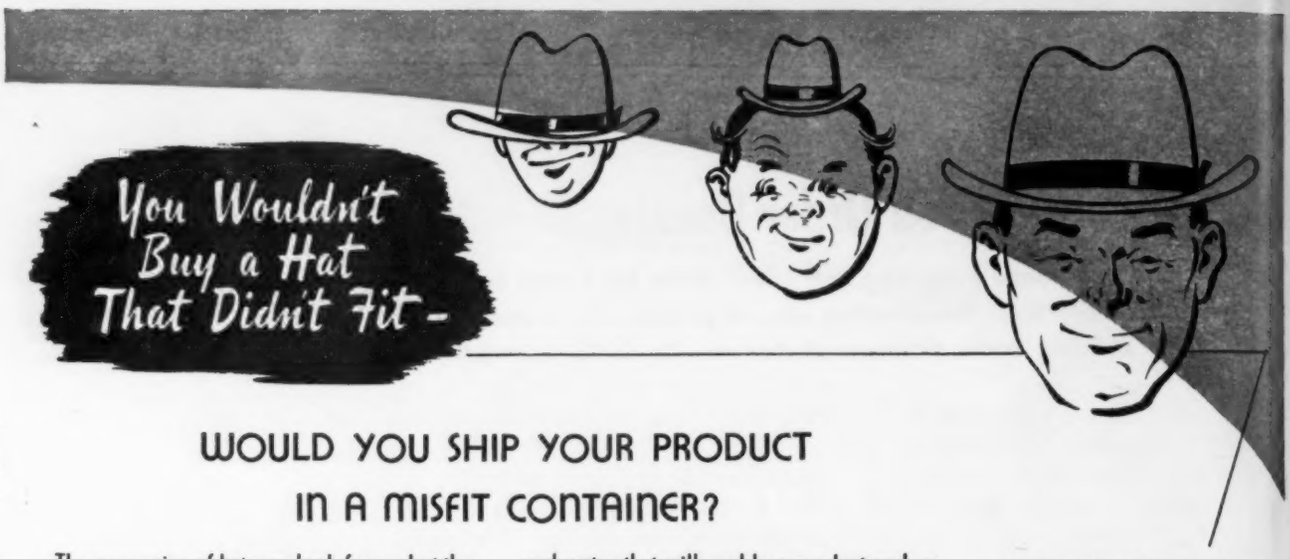
Construction of the new building has made it possible to use the 14,000 sq ft of the old administration building for production of the company's standard line of engine and other lathes.

Spent $6 Million . . . Earlier this week, Norton Co., Worcester, Mass., took the wraps off the new $6 million expansion of its grinding machine division. The 27,000 sq ft plant enlarges the company's machine tool capacity by about 50 pct.

Among the new plant's many features are straight-line production layouts, special materials handling equipment, air recirculating dust control equipment, and a forced ventilation system. Employees in the grinding machine division now number 1400, 400 more than were employed prior to the expansion.

Tool and Die Survey . . . The continuing shortage of tool and die makers has prompted the National Tool & Die Manufacturers Assn. to undertake a survey of apprentice training throughout the contract tool and die industry.

Purpose of the survey is to find out what is now being done and to obtain information and suggestions that will make training more effective and stimulate interest in extending apprenticeship training.



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The wrong size of hat may look funny, but the wrong shipping container is no laughing matter. More often than not, it is the cause of excessive shipping losses, damage claims and transportation charges.

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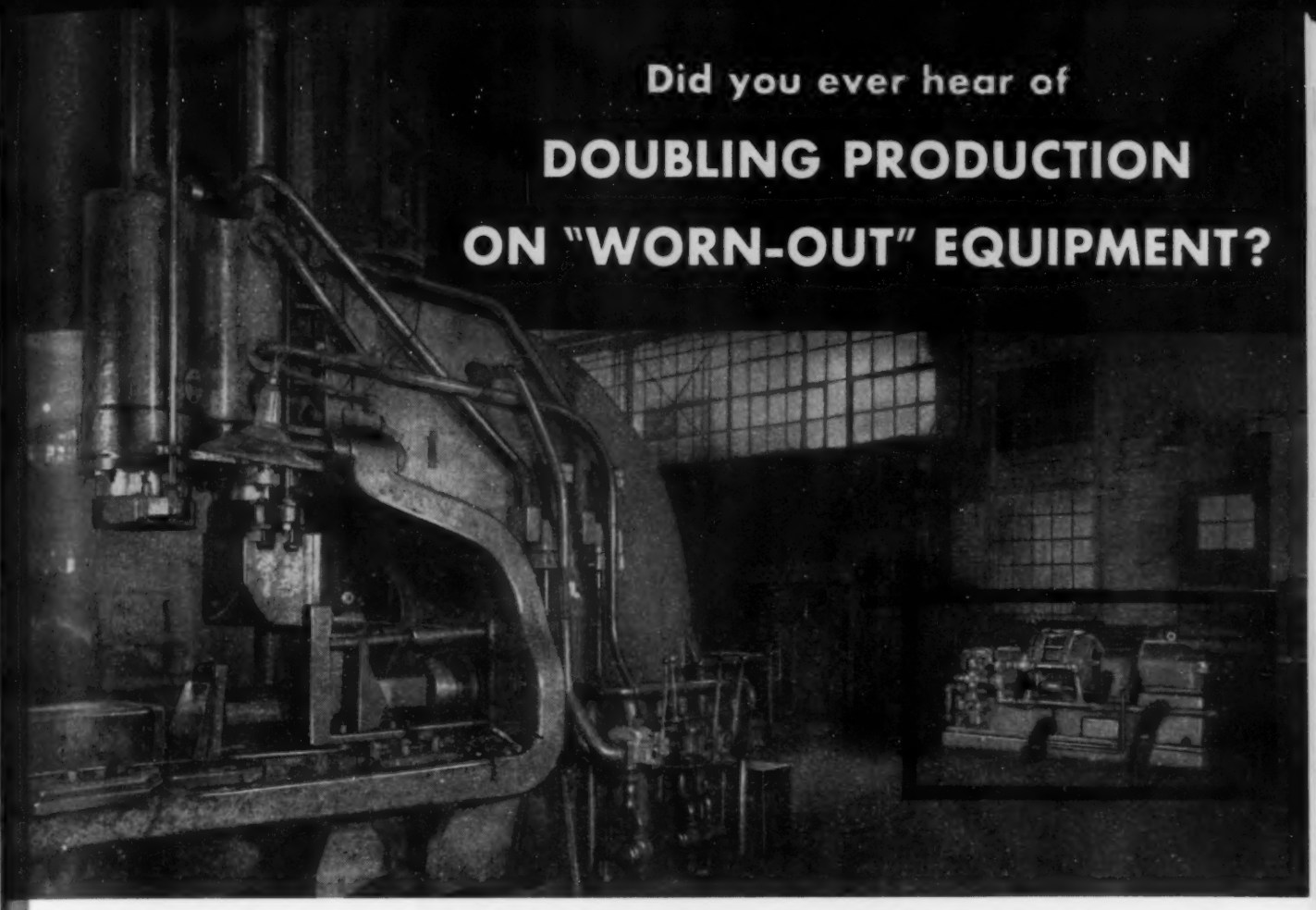

You may gain a valuable hint from this story how Treadwell renovated an old belling machine with Oilgear Fluid Power

The belling machine used for flanging big boiler ends in the Treadwell Corporation plant at Midland, Pa., has seen many years of service. The machine was slow, was "down" a lot, maintenance was high and production was off.

A careful analysis indicated that the press itself was not at fault; the trouble was associated entirely with the water pump, storage and accumulator system used to power the press gripping and main rams.

Two alternatives confronted the Treadwell people. One was to repair or replace the water system. This ran into a figure prohibitively high. It would not solve the problem of high maintenance, faulty control, erratic performance, the shocks inherent in the system, the slow cycles.

The Treadwell people chose the second alternative and called in an Oilgear Fluid Power engineering representative. This is what happened:

A standard Oilgear Fluid Power system was installed, without modification to the press. The only change was some rearrangement of the piping system. The cost was from one-fourth to one-third that of repair to or replacement of the water power system.

The operation of the rams was speeded up, the total time for each cycle cut from 66 seconds to 34 seconds. Therefore actual press production was almost doubled. Because the power medium used is oil, friction and wear become almost non-existent. The space required is slightly less than that required by the water pump, but the bulky water tank and accumulator were eliminated altogether.

The interesting thing about this Oilgear Fluid Power, which is smooth, shockfree and dependable is that from the one source, power travels to actuate the gripping rams, then while holding them at gripping pressure, travels over to the main or shaping ram and actuates it; then the same power retracts the rams in order and goes into "neutral" during the next handling step.

The above is only one of a number of similar press "renovations" being performed with the use of Oilgear Fluid Power.

Think of Oilgear Fluid Power as similar in every respect to electric power. It is generated, piped, and applied in the same way, with these **important** exceptions: Oilgear Fluid Power can be used in linear movement where electricity cannot. Oilgear Fluid Power speed can be varied steplessly, smoothly, infinitely where electricity cannot — or only with costly, troublesome, **extra** equipment. Oilgear Fluid Power can be "bled" off, dissipated harmlessly in case of shock. Oilgear is massive, tremendous, resistless power that can be controlled with micrometer precision.

It is probably the most amazingly versatile power there is. Consider Oilgear Fluid Power to improve the saleability of new machines, to renovate old machines, to solve a hundred troublesome problems where other power has failed to help. It costs you nothing to find out. THE OILGEAR CO., 1581 W. Pierce St., Milwaukee 4, Wis.

OILGEAR

OILGEAR

THIS PICTURE TELLS A STORY of a new cost-cutting opportunity for steel mills

Note the ready accessibility of each item of steel in this storage yard of a well-known steel mill. It's this availability of materials that's one of the prime advantages of the ROSS STRADDLE CARRIER handling method . . an advantage, unmatched by any other method, that eliminates delays, lowers costs and increases the production efficiency of the mill.

ROSS STRADDLE CARRIERS, heart of the Ross unit-load handling system, are built to handle 45,000-pound concentrated loads on around-the-clock schedules in the roughest, toughest steel mill service . . . to put those loads *where* wanted *when* wanted.

Your mill, too, can profit by this modern, flexible mass handling system. Get in touch with Ross today for the complete details.

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Continued

Steel tubing

Babcock & Wilcox Co.'s Croloy 5, an alloy tubing steel for use in applications requiring high temperatures, is covered in a new technical data card. This tubing steel is particularly resistant to corrosion from hot oil, hydrogen sulfide, elementary sulfur and organic sulfur compounds such as are encountered in petroleum processing. Included in the bulletin are data on mechanical properties, creep strength, physical properties, welding, fabrication and heat treatment. *Babcock & Wilcox Co.*

For free copy circle No. 13 on postcard, p. 121.

Lathes

Simmons heavy-duty geared-head engine lathes have been redesigned for more power and greater rigidity and are well suited for ordnance, plants, shipyards and other shops where heavy work in turning, facing and threading to close tolerances is routine. Features of the units are outlined in a new leaflet. *Simmons Machine Tool Corp.*

For free copy circle No. 14 on postcard, p. 121.

Springs

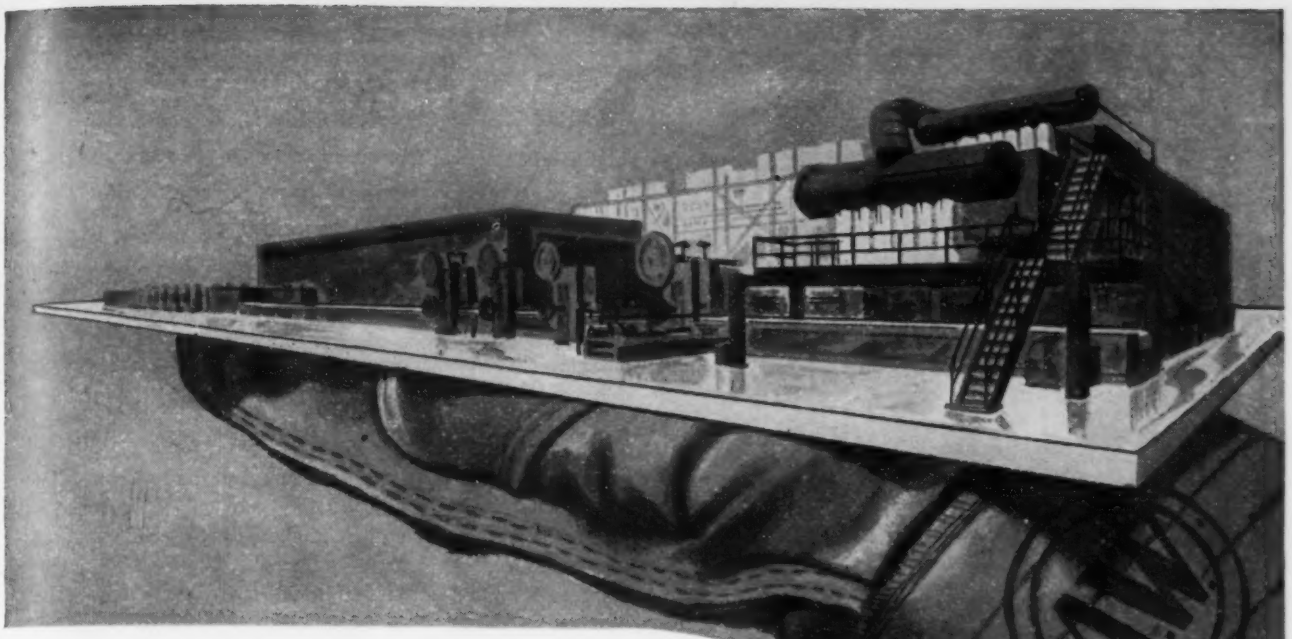
Wales Hydra Springs use compressible fluids to produce spring pressures up to 3800 lb. Because they can produce high pressures, these springs are ideal for stripping actions in all types of dies. Complete details are given in a new circular. *Wales-Strippit Corp.*

For free copy circle No. 15 on postcard, p. 121.

Water consumption

Sandusky Foundry & Machine Co. has issued a new slide rule type water consumption calculator that enables the user to determine the water consumption for various size Sandusky shower pipes. In addition there are recommendations on hole spacings for different applications. *Sandusky Foundry & Machine Co.*

For free copy circle No. 16 on postcard, p. 121.



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• The Alan Wood 30″ continuous mill continues to produce at top speed plates, sheets and strip.

Everything possible is being done to improve our facilities and to expedite production to give you the best possible service.

Remember, too, that Alan Wood's mine-to-mill integrated production line assures you of high grade steel.

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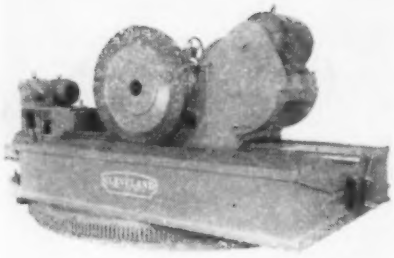
NEW EQUIPMENT

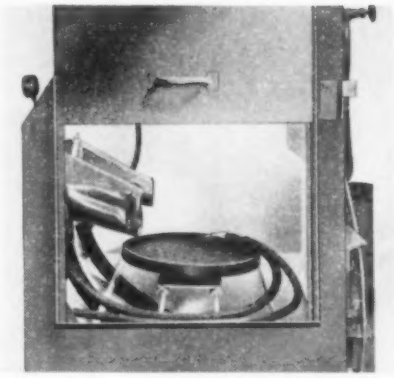
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 121 or 122.



Rotary planer mills castings, structural members

New rotary planer used for milling structural members and castings such as ingot molds can be furnished with various diameters of cutter heads to suit particular needs. The illustration shows a 48-in. cutter head which has 4 in. in and out adjustment by means of hand wheels arranged so that adjustment can be made from either side of the carriage. The planer is equipped with hydraulic feed for travel of the cutter head which operates at 50 fpm. Planing length is 7 ft 6 in. with feed from 1 to 10½ in. *Cleveland Punch & Shear Works Co.*

For more data circle No. 17 on postcard, p. 121.



Wet blasting machine cleans, finishes small pieces

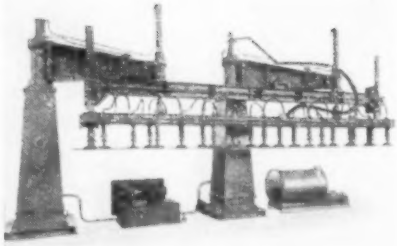
Model 30 Liquamatte is intended for precision cleaning and finishing applications involving small pieces that can be lifted and handled manually. The wet blasting machine is 2½ ft square x 6 ft 11 in. high, has blasting compartment 30 in. square x 2 ft 7 in. high. A 15 in. diam rotating work table holds the work, and small portable auxiliary tanks are available to receive parts for rinsing. Fine mesh abrasives, suspended in water, are propelled at the work by compressed air. Close tolerance dimensions are maintained. With his arms through armholes operator manipulates the abrasive gun with his hands while operating the compressed air valve with his knee. *American Wheelabrator & Equipment Corp.*

For more data circle No. 18 on postcard, p. 121.

Rubber hoist handle has non-slip quality

Safety type hoist handles are designed to fit all hoists using separate pulls for raising and lowering. They are molded of a special industrial rubber formulated for resistance to oil and grease. Non-slip quality is provided by molded gripping ridges which circle the handle from top to bottom. Easy identification of handle action is assured by *up* or *down* lettering molded as a permanent part of the handle. Because of their rubber construction and the design which eliminates all sharp edges and surfaces, these handles are said to minimize or eliminate accidents to eyes and face caused by hard-surfaced handles. Handles are simple to install; slip the hollow handle over the hoist cord and knot the cord to fasten within the handle end. Sold in pairs. *Byron Jackson Co.*

For more data circle No. 19 on postcard, p. 121.



Vacuum unpiler moves brass slabs and plates

This vacuum unpiling and stacking machine picks up and moves 24-ft brass slabs or plates weighing 880 lb a distance of 4½ ft from one table to the receiving table, where they are deposited. It handles three such slabs per minute. The stacker has a pickup beam 22 ft long, on which a series of suction caps mounted in staggered arrangement permit the machine to handle slab, plate or sheet up to 42 in. wide. Cups are spring loaded to insure positive grab. *W. S. Rockwell Co.*

For more data circle No. 20 on postcard, p. 121.

Turn Page

HANDLING HELPS

by A.L.L.

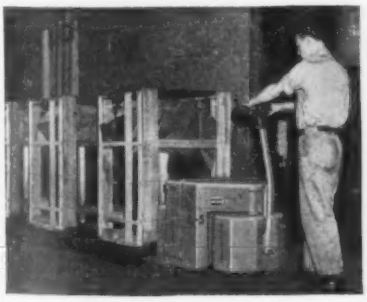
No More Achin' Backs

The Lewis-Shepard Working Height Lifter is a natural addition to your mechanized handling system. Full

loads can be deposited onto it at floor level by your electric trucks. Smooth hydraulic action brings the work right up to working height by simple foot controls. No stoop . . . no strain . . . no fatigue! This equipment has unlimited possibilities, so be sure to write for details or call your local Lewis-Shepard representative.

Operating Ease . . . Built In

Try it and you'll see what we mean. All controls in the palm of your hand give more control, quicker application of speed, direction, brake, lifting



and lowering. Because all controls operate with handle in vertical position, you save 6" to 9" of aisle space. Braking is instant and smoother. Simply release your hand pressure for cushioned stops — with handle in *any* position, too. It's the Lewis-Shepard JackLift Electric Truck — the quality truck in the Walkie field — shown on the job at the G. E. River Works. Compare the JackLift Electric with other Walkie trucks and see for yourself! Write for free Comparison Chart. *Lewis-Shepard Products, Inc., 115-4 Walnut Street, Watertown 72, Mass.*

Efficient use of every cubic foot of space is more important than ever with today's high construction and operating costs. That's why Lewis-Shepard SpaceMaster Electric Fork Trucks are so popular with leading companies who have learned the tremendous economies of mechanized handling.

SpaceMasters are noted for their compact design and greater maneuverability. Aisle widths can be held to absolute minimums . . . valuable extra space put to work. And SpaceMasters have an enviable record of dependability under heavy duty operation.

At the General Electric Company River Works, for example, Lewis-Shepard SpaceMasters are used for transporting and stacking a variety of pallet loads up to 4000 lbs. Every day these trucks get in and out of places you'd never think possible, earning the praise of G. E. Plant Engineers for their combined ruggedness and maneuverability.

When you compare Lewis-Shepard Electric Trucks — feature for feature — you'll see why leading companies in every industry pick them. Their many unique design and engineering advantages, outstanding maintenance records, and greater dependability add up to the best dollar-for-dollar value on the market today. Want proof? Send for Comparison Charts and "Proof Folders" showing L-S Trucks on-the-job. Use coupon for convenience.

HERE'S MORE PROOF OF LEWIS-SHEPARD ELECTRIC FORK TRUCK DEPENDABILITY

Blue-Chip companies in these industries recently reordered L-S Fork Trucks:

Paper Mfr.	26 L-S in use — reordered	3
Elec. Gds. Mfg.	41 L-S in use — reordered	13
Grocery Chain	6 L-S in use — reordered	1
Paint Mfr.	1 L-S in use — reordered	6
Motor Transport	1 L-S in use — reordered	12
Auto Mfg.	4 L-S in use — reordered	1
Bottler	2 L-S in use — reordered	5

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Without obligation, send me your Catalogs, Comparison Charts and "Proof Folders" showing L-S SpaceMaster Trucks in action.

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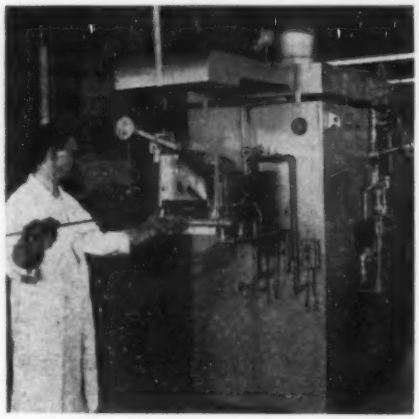
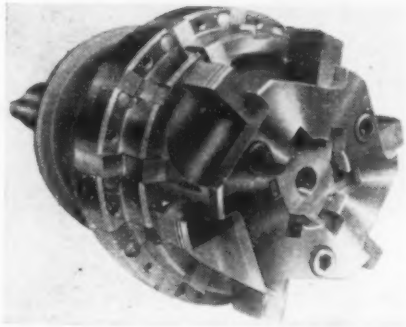


Heat treating furnace handles batch work

Temperatures up to 3100°F can be obtained in a new metallurgical heat treating furnace. A water jacketed chamber, an integral part of the furnace, permits work to be cooled as well as heated in a protective atmosphere. The furnace uses hydrogen or dissociated ammonia. Four manually operated, counterbalanced doors on the furnace separate its charging, heating and cooling chambers. Intended for batch type heating, the work is handled on trays and manipulated by push and pull rods. Cooling chamber is constructed of welded steel plates to incorporate a water jacketed housing. Cooling of the charge below the oxidation point before it is discharged is assured. Heating elements are heavy molybdenum alloy rod. Protective atmosphere consumption is between 150 and 200 cu ft per hr. *Westinghouse Electric Corp.*

For more data circle No. 21 on postcard, p. 121.

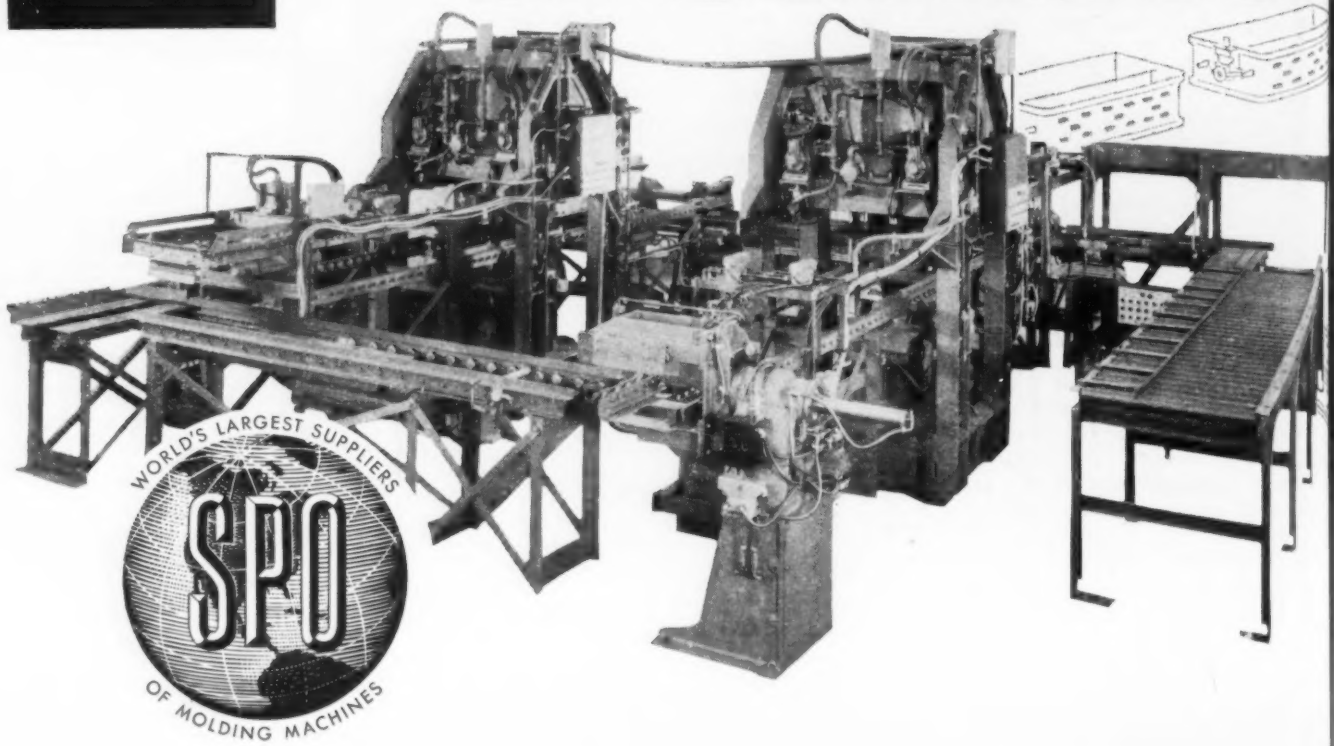


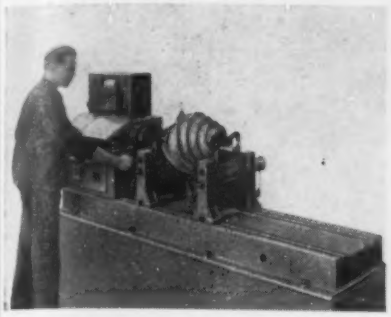
Four operations possible with one chucking

Combining boring, counterboring, and facing blades with conventional tap chasers in a 7-in. ALT tap head affords maximum production with reductions in cost. The workpiece can be bored, counterbored, faced, and tapped with one chucking, and these operations are done with tap chasers collapsed. Upon completion of the operation the tap is withdrawn and tap chasers are expanded. The thread is then tapped on the surface previously bored. A leadscrew feed is recommended for the tapping and boring operations to assure long tool life and a quality finish. *Landis Machine Co.*

For more data circle No. 22 on postcard, p. 121.

SPOMATIC

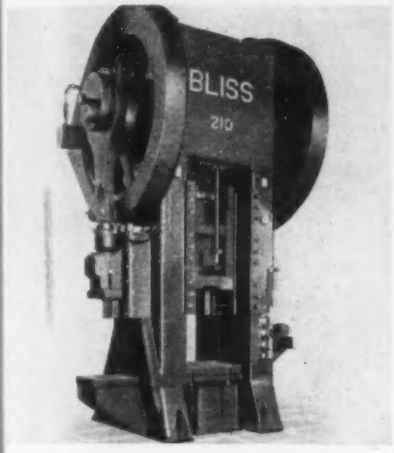




Machine determines unbalance in rotating parts

In less than a minute, in a single run, Schenck electro-dynamic, balancing machines accurately determine the amount and location of dynamic and static unbalance in rotating parts. Various models have weight capacities which range from a few ounces, in the smaller machine, to over 100 tons. Each balancer has electrical measuring system, without electronic tubes or oscillograph, that will indicate unbalance caused by displacements of as little as 0.00004 in. from the center of gravity. Such measurements are indicated on a wattmeter. *Cosa Corp.*

For more data circle No. 23 on postcard, p. 121.



Trimming press operates at 35 strokes per min

Streamlined box-type crown construction is a feature of a new line of trimming presses which are designed for rigidity and quietness of operation. The single-geared presses are of four-piece frame welded steel construction with twin herringbone driving gears running in oil and equipped with rim-type, oil tight gear guards. Among the features of the No. 210 model are an air counterbalance concealed in the uprights, automatic lubrication and the Bliss fast-acting, cool-running friction-type clutch. A friction clamp slip-type knockout prevents accidental breakage of dies, or other parts. Ram capacity is 440 tons. The slide has 16-in. stroke with a motorized adjustment of 6 in. and the trimming attachment has a 10-in. stroke with 4-in. adjustment. The press is 18 ft high, weighs 98,000 lb. *E. W. Bliss Co.*

For more data circle No. 24 on postcard, p. 121.

Turn Page

HEART OF THE Automatic Foundry

The new SPOMATIC molding machine makes the automatic foundry of the future possible today!

This high-speed mass-production machine makes accurate copes and drags simultaneously . . . sets the cores . . . closes the molds . . . and puts them on the pouring conveyor. Then, after molds have been poured and put through the cooling cycle, the SPOMATIC knocks out, cleans, and separates the flasks and feeds them into their respective ramming unit for immediate re-use.

Once a SPOMATIC is started, *all operations are fully automatic, continuous and mechanical.* Complete operating cycle is set up quickly and easily by means of pushbutton-actuated electrical controls. Master control panel utilizes only two buttons ("ON" and "STOP") and three selector switches.

SPOMATIC installations are engineered to individual foundry requirements. SPO engineers will be glad to discuss your needs and to make recommendations. Write for additional information or call DIamond 1-3666.

SPO INCORPORATED

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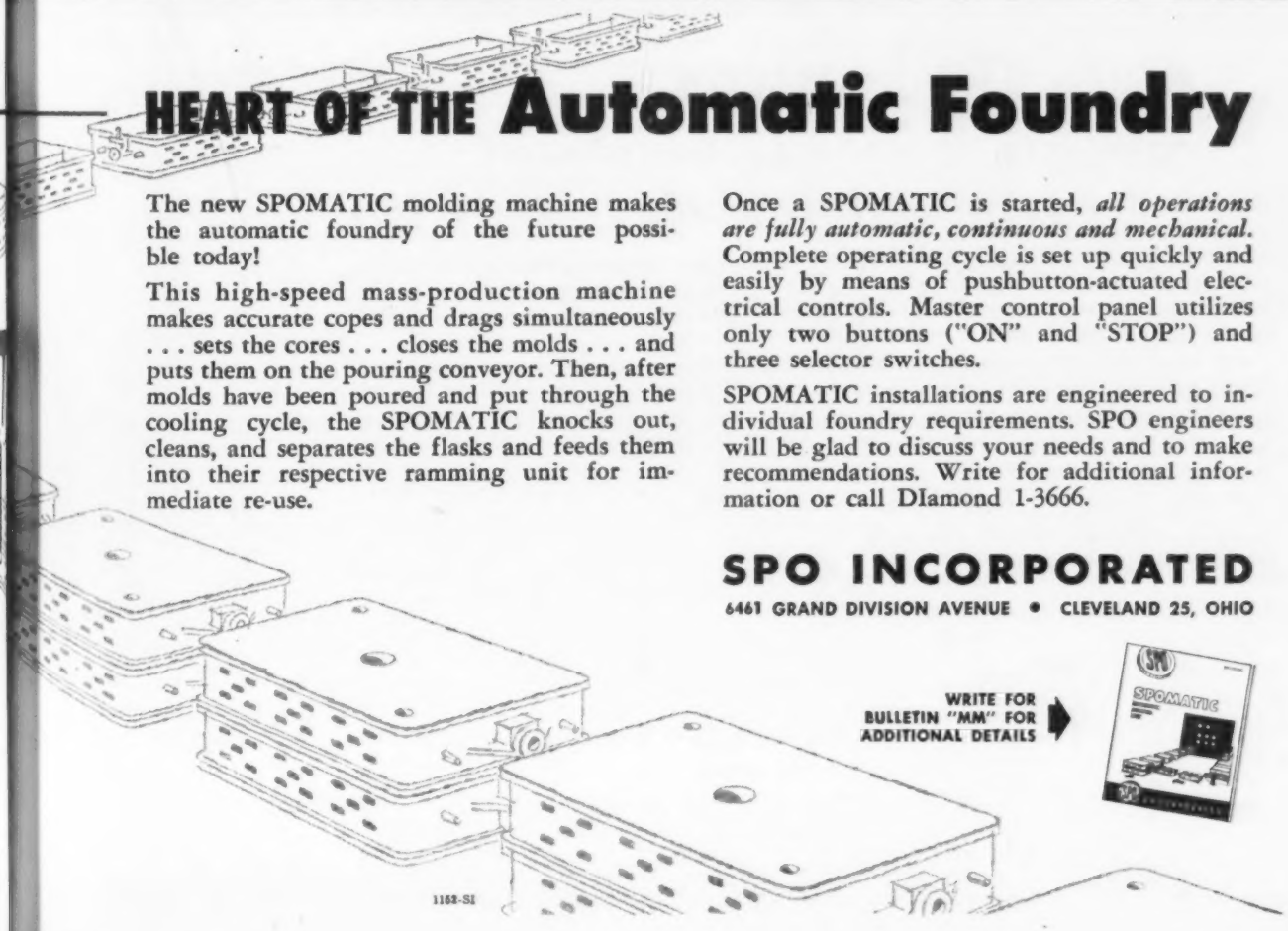
WRITE FOR BULLETIN "MM" FOR ADDITIONAL DETAILS



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P&H OVERHEAD CRANES

Only P&H BUILDS

COMPLETE ELECTRICAL EQUIPMENT

— designed specifically for Crane Service

You'll find a big difference in the crane electrical equipment built by P&H and that assembled from various sources. P&H designs it specifically for the severity of crane service. General purpose motors are not used. P&H has learned how to build crane motors through more than 50 years!

You'll find a big difference in performance—the entire crane is designed and built as a coordinated unit. P&H understands how to give you the utmost in faithful performance.

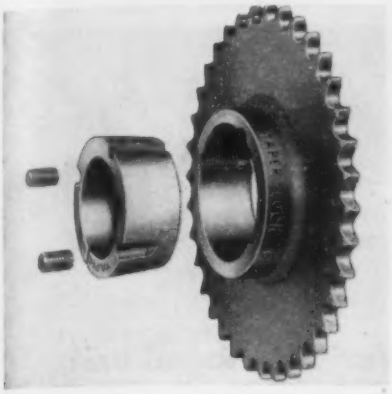
And you'll find a big difference in service when you need it. For only in this way can you put *all* the responsibility in the hands of *one dependable source*. There's no buck-passing among suppliers—no confusion or delays. P&H service is complete—reliable—alert. It will save you time and money. It's good reason for insisting upon P&H equipment throughout.

P&H *MAGNETORQUE*® **AC Crane Control** . . . an exclusive P&H development which provides speed-load characteristics not excelled by any other type of control. You should have all the facts about it. Write us.

P&H OVERHEAD CRANE DIVISION

HARNISCHFEGER CORPORATION

Milwaukee 46, Wisconsin



Sprockets and chains

Off-the-shelf availability to roller chain drives is provided by a line of Taper-Lock sprockets and Dodge roller chain. Sprockets and bushings are available in a range of sizes for the majority of industrial applications, eliminating time consuming reboring of sprockets to fit shafts. It is not necessary that shafts be turned and ground to get a tight fit. Taper-Lock is keyed to the shaft, grips it with the firmness of a shrunk-on fit. The sprocket comes off quickly, and easily for replacement; bushing may be reused. Chain and sprockets are made to ASA standards. *Dodge Mfg. Corp.*

For more data circle No. 25 on postcard, p. 121.

Ladle stopper

A new ladle stopper will not crack from heat shock, offering almost absolute control over pouring of molten steel into ingot molds. It is made of fire clay, graphite and a special synthetic ingredient. The product is said to suffer only slight change in contour due to erosion by the steel. *Electro Refractories & Abrasives Corp.*

For more data circle No. 26 on postcard, p. 121.

Electrical tape

New electrical tape is designed for wrapping motors, generator coils, magnetic and transformer windings. Known as Permacel Two-In-One, it sticks at a touch and heat-cures into a permanent bond. It won't soften or come loose, slip or slide, either during varnish baking or in the end use of the product. Available with backings of paper, cloth, film or acetate fiber. *Industrial Tape Corp.*

For more data circle No. 27 on postcard, p. 121.

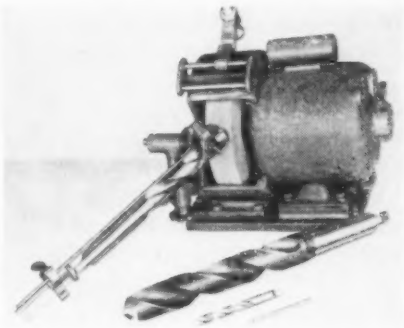
Immersion heaters

Over-the-side steel electric immersion heaters are designed for metal finishing alkaline cleaning tanks. They are equally suited for heating cyanide baths such as used in plating brass, bronze, cadmium, gold and copper. The Glorod Series W heater is designed for safe operating temperature of the nickel alloy resistance element. Low heat density protects both heater and liquids from damage due to carbonization or frying. A vapor proof junction box prevents entrance of vapors and liquid. Units are portable, a single unit can serve many tanks and be quickly mounted over the side of the tank, or as in the case of vapor degreasers, screwed into 2-in. threaded holes in the bottom of tanks. When controlled by a thermostat, they operate only for the period of time required to maintain the desired bath temperature. *Cleveland Process Co.*

For more data circle No. 28 on postcard, p. 121.

Twist drill grinder

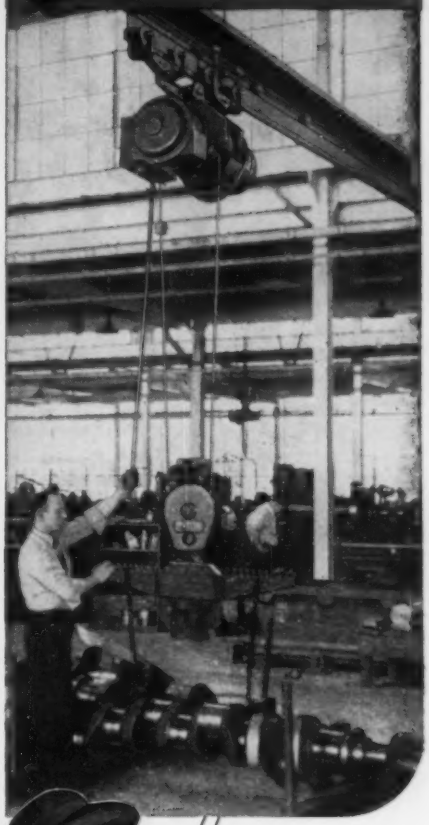
Combining accuracy with simplicity of operation, a new grinder provides a low-cost method of increasing the service life and efficiency of twist drills and of reducing material spoilage due to imperfectly drilled holes. Model 200 requires only two holders to sharpen all sizes of



straight or taper-shank twist drills from ⅛ to 1½ in. Changeover time is held to a minimum and virtually foolproof operation is assured when several different sizes are sharpened. Infinite range of point angles for drilling different kinds of materials is instantly obtained by a simple one-knob adjustment. *Alden Industries.*

For more data circle No. 29 on postcard, p. 121.
Turn Page

P&H ELECTRIC HOISTS



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P&H ELECTRIC HOIST DIVISION

HARNISCHFEGER CORPORATION

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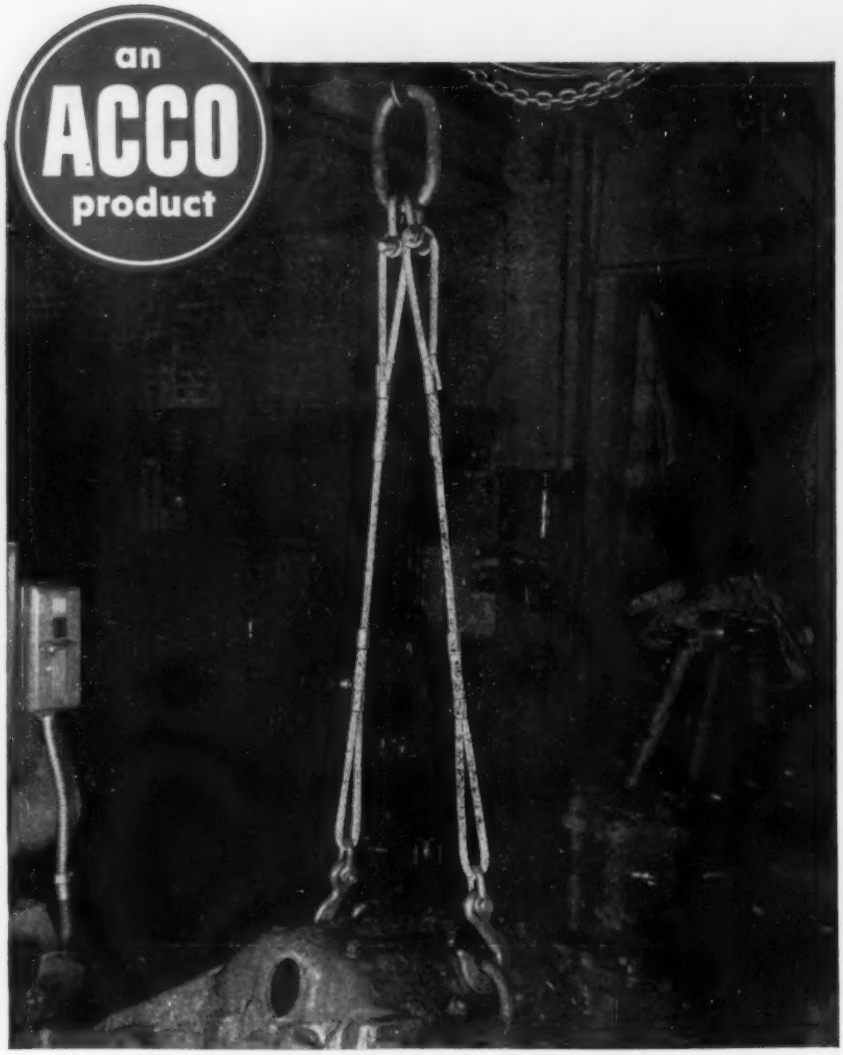

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3 • **ACCO Slings are Stocked by Your Industrial Supply House**—His stock is based on YOUR needs. So, your sling inventory can be held to a minimum since your distributor's stock is as close as your telephone.

4 • **These Slings and Fittings are "ACCO *Registered*"**—This assures you of highest quality and safety throughout.

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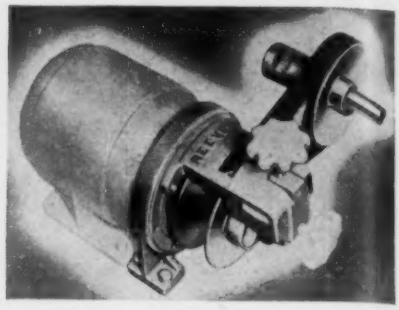


Variable speed unit

The Flexi-Speed, a new variable speed unit which combines flexibility in operation and application with low unit cost, may be mounted in almost any position around the driven equipment. It may drive in any direction, and can deliver any desired speed within a ratio of 8:1. Flexi-Speed drives are available in ½, ¾, and 1 hp capacities. Adaptable to such industrial applications as in-line or right angle reducers, counter-shafts, chain and sprocket or V-belt drives. *Reeves Pulley Co.*

For more data circle No. 30 on postcard, p. 121.

Midget socket wrenches

Midget size socket wrenches and parts have been designed especially for electronics technicians, carburetion specialists, electricians and others who require use of small size assembly and adjustment tools. Drop forged from Billings Vitalloy

steel the new series is precision-made and conforms to recognized standards for accuracy, quality and durability. Sockets are available in six and eight point styles. Wrenches and parts are available singly or in four different sets. *Billings & Spencer Co.*

For more data circle No. 31 on postcard, p. 121.

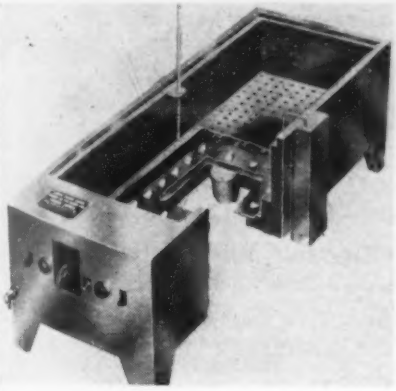
Commercial lockbolt

A new fastener, called the R-1018 Commercial Lockbolt, has been developed for permanent wood-to-metal fastening at production proven speeds up to 2000 completed fastenings per hour. Using a pneumatic pull gun the work is automatically pulled tightly together in a continuous and almost instantaneous operation. Finished assembly is tighter than a rivet, as strong as a bolt and cannot loosen. The Lockbolt is available in 3/16 and ¼ in. diam. The pin portion is fabricated from mild steel and the collar from 61S aluminum. *Huck Mfg. Co.*

For more data circle No. 32 on postcard, p. 121.

Utility water bath

The new Magni-Whirl utility water bath provides complete, gentle agitation in all areas of the liquid mass irrespective of how heavily the bath is loaded with test specimens. This is accomplished by an



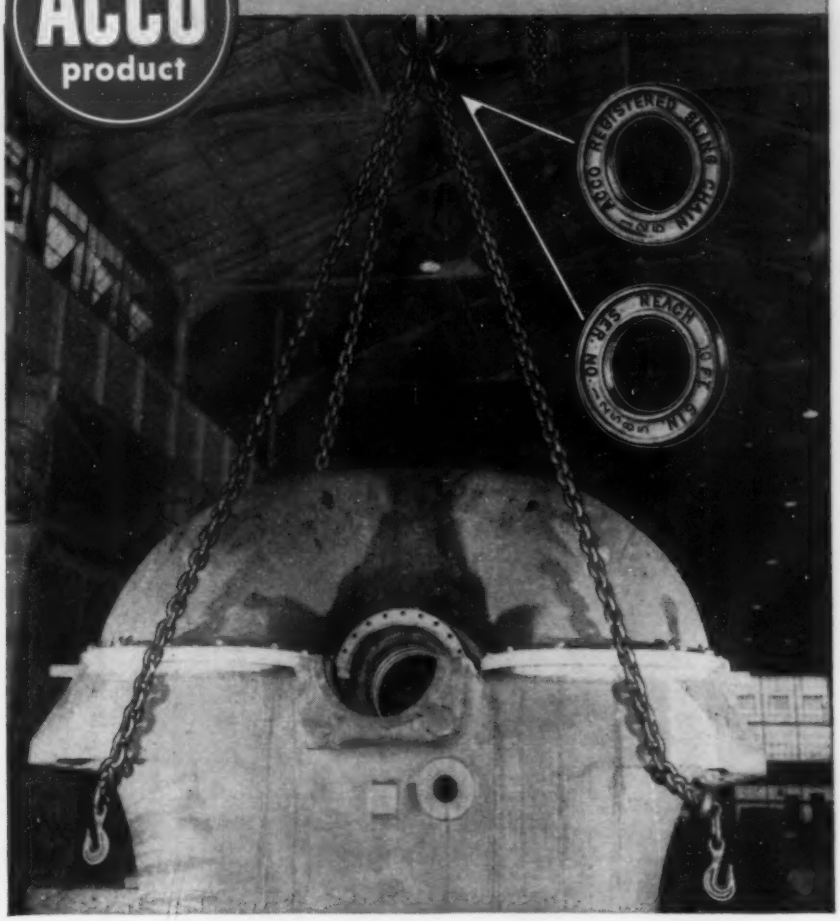
automatic self-timing electro magnet below the bottom wall of the bath, which periodically pulls the flexible perforated circulator plate up and down. This system is said to automatically maintain temperatures up to 100°C throughout the entire water mass, to within ± ¼°C. The Magni-Whirl has 100 pct working area always usable. An automatic dual Microtrol selects and repeats the two most used temperatures. A power selector switch automatically permits selection of proper wattage in relation to desired temperatures. *Blue M Electric Co.*

For more data circle No. 33 on postcard, p. 121.

Turn Page

an ACCO product

AMERICAN CHAIN



"*Why do we use American Chain?*"

"For two reasons," said this manufacturer of heavy machinery. "First, we have used American Chain successfully for years. Second, the high strength alloy it is made from permits using smaller diameter chain which is hooked up easily by our men. And the men like the way the grab hooks slip over the links and set themselves securely. I think they just feel safer working with American Chain."

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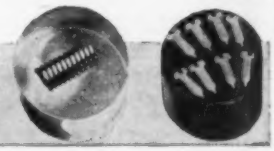

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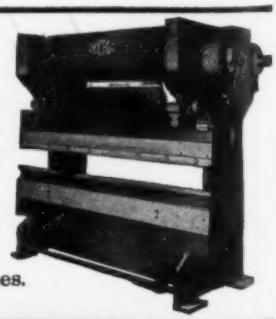
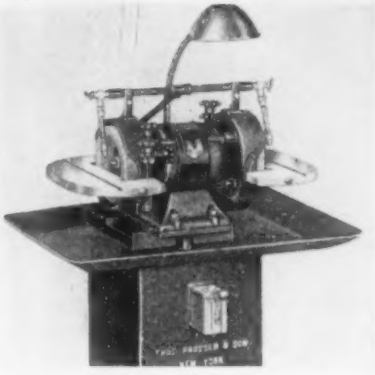


DREIS & KRUMP MANUFACTURING COMPANY
7430 S. Loomis Blvd., Chicago 36, Illinois
CHICAGO

Wet grinder

A new moderately priced wet grinder is suitable for the average shop requiring a good sturdy high quality machine with adequate wet grinding equipment for doing a variety of roughing and finishing work. The Model AW embodies features of the regular Model AA machine, including the quick acting indexing tables, which stay put without locking screws or other



gadgets. The machine is provided with a separate motor-driven coolant pump, pan, settling tank, piping, valves, nozzles, and spray guards, and delivers a copious flow of water directly to the tool being ground. Drum type on-off-reverse switch, combination protractor toolguide and truing tool holder, electric light, and brake are other features. *Thomas Prosser & Son.*

For more data circle No. 34 on postcard, p. 121.

Shipping case sealer

Sealing paper shipping cases by applying glue in spots at ¾-in. centers is accomplished by a new machine called the Packer-Gluer. Advantages are faster and tighter adhesion since each spot is aereated around its entire circumference, allowing the glue to spread and become absorbed much faster than when applied in an allover design. The machine will handle a wide range of sizes and will seal both top and bottom flaps. Operation is intermittent; the operator packs the case on a packing table and moves it slightly forward, where it contacts a starting trip. All other operations are automatic. *J. L. Ferguson Co.*

For more data circle No. 35 on postcard, p. 121.
Turn Page

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INDUSTRIAL MOTORS

Every Electro Dynamic motor is built with
EXTRA INSULATION in stator slots and between phases
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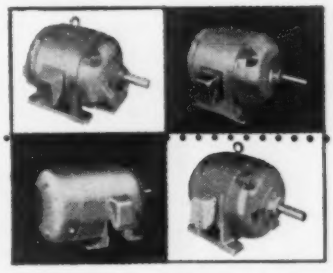

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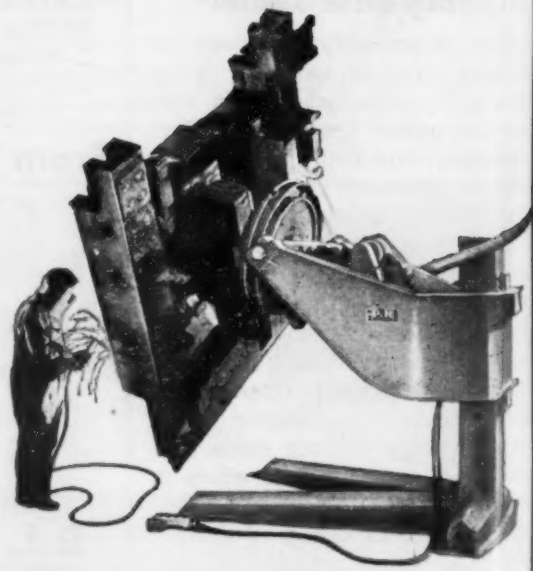

P&H WELDING DIVISION
HARNISCHFEGER CORPORATION
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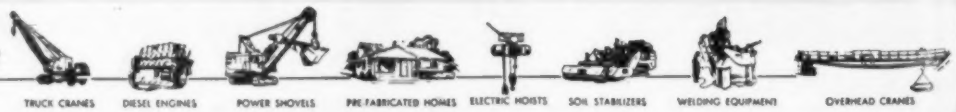
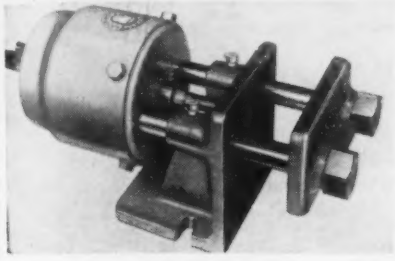


TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

Air-controlled vise

A new air-controlled vise is simple and may be synchronized with operations of vertical and horizontal milling machines, drill presses, boring mills, shapers, and other machine tools. It is fully equipped with a Bendix-Westinghouse Robotair chamber. Design of the Rik vise places the air cylinder and stationary jaw on the same side of



the workpiece, resulting in greater safety and speed for the mill operator. Because the moving jaw is at the end of the assembly instead to the air cylinder, the cutting tool need not pass over the cylinder; the operator has more room to work safer and faster. Overall length of the Rik is 12 in. *Wilson Bohannan Co.*

For more data circle No. 36 on postcard, p. 121.

Vitrified bond

A new vitrified bond for Norton grinding wheels is said to offer unusual performance for cylindrical, centerless, surface, internal, gear, tool and cutter, form and thread grinding, and saw gumming. G-Bond's ability to make a grinding wheel act so much better is due basically to the way the abrasive grains are held by the bond until they have accomplished their cutting job, and are then released to make room for new grains with fresh, sharp cutting edges. G-Bond holds the grains just long enough to keep the wheel's grinding surface at peak efficiency. The new bond can be used in conjunction with many types of abrasive including: 32 and 38 Alundum, regular Alundum, 19 and 57 Alundum abrasive. *Norton Co.*

For more data circle No. 37 on postcard, p. 121.

Spindle improvement

Sixty percent less air noise caused by air discharge is effected by installation of a muffler in Vulcanaire jig grinders and spindles. By dissipating the exhaust energy through hundreds of small openings, each of which is capable of handling small sections of air, the resulting flow enters the outside atmosphere in a much smoother manner. *Vulcan Tool Co.*

For more data circle No. 38 on postcard, p. 121.

Strip mill roll

Reduction of downtime is the No. 1 target of a new hot strip mill work roll. The new alloy iron M-H Anniversary roll is said to be increasing roll time in strip mill finishing stands over 50 pct and in some extreme cases 200 pct. Secret of the roll's success in giving long service between redressings is a modified heat treatment procedure. The roll is double-poured hard and then tempered: casting the roll to a hardness of 82 scleroscope and then low-temperature heating, or drawing it back, to 75 scleroscope. The service record of the rolls is being made in the first two or three roll stands of the finishing train in a modern four-high hot strip mill. *Macintosh-Hemphill Co.*

For more data circle No. 39 on postcard, p. 121.

Laminated cutter

A carbide-tipped milling cutter with a laminated body gives greater cutter life, minimum vibration and a better bond between the tip and cutter body. It is made in a 6-in. diam in thicknesses from ⅛ to 2 in. Cutters are made in three grades for milling aluminum and magnesium, cast iron and mild steel, and high-strength steels. *Superior Cutter Co., Inc.*

For more data circle No. 40 on postcard, p. 121.

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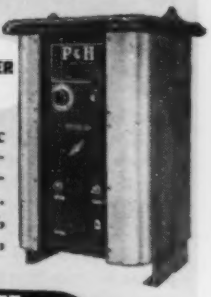
Arc Welders and Electrodes

put welding in your plant on a low-cost, high-production basis

P&H DC RECTIFIER WELDER

Has Dial-lectric Control for instantaneous heat selection at the work. Three sizes, 200, 300, and 500 amps., NEMA rated.



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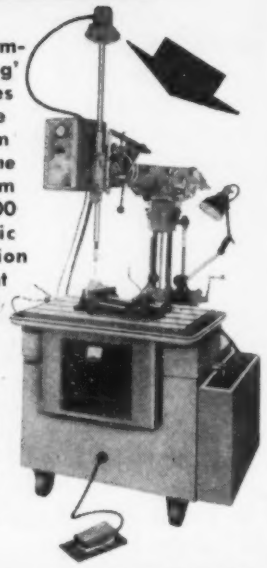
DRILL HOLES AS SMALL AS .030" IN ANY METAL OF ANY HARDNESS OR THICKNESS!



The M-300 Elox Electron Drill* combines the best in the 'arc machining' process. In addition to drilling holes as small as .030" it is adjustable for machine finishes ranging from *coarse, fine, extra fine and super fine* ...on any metals from magnesium to cemented carbide. The M-300 with exclusive Elox Automatic Feed allows for continuous operation with much of the human element removed. Using electrodes costing less than 3¢ per inch, with 'super fine' cutting, 1" of electrode will cut as much as 33" of hardened steel! Here indeed, is a dual-purpose machine that is being used for production machining of hardened steels and for removing broken drills in salvage. Write today for details and list of users.

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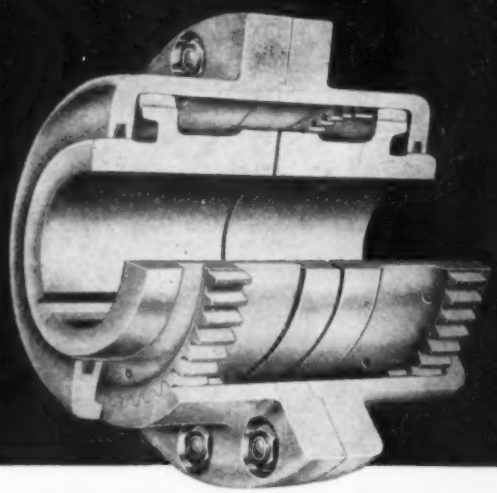

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The Iron Age

SALUTES

Sam S. Mullin

One of the country's youngest top executives, he gets things done quietly and efficiently.

SAM MULLIN is a practical man who believes in getting things done with a minimum of fuss and flurry. Although the 38-year-old president of the Cleveland Pneumatic Tool Co. is one of the youngest top executives in the country, his rise in industry has earned wide respect.

A close business associate who has followed Sam's career since his graduation from Yale Law School in 1940 says Sam had to succeed because he knows how to delegate authority and cut red tape.

After a short time as assistant to general counsel for the lend-lease administration, Sam served with the Air Force from 1942 to 1945. Discharged, he became associated with the Syracuse law firm of Bond, Schoeneck & King in his home town.

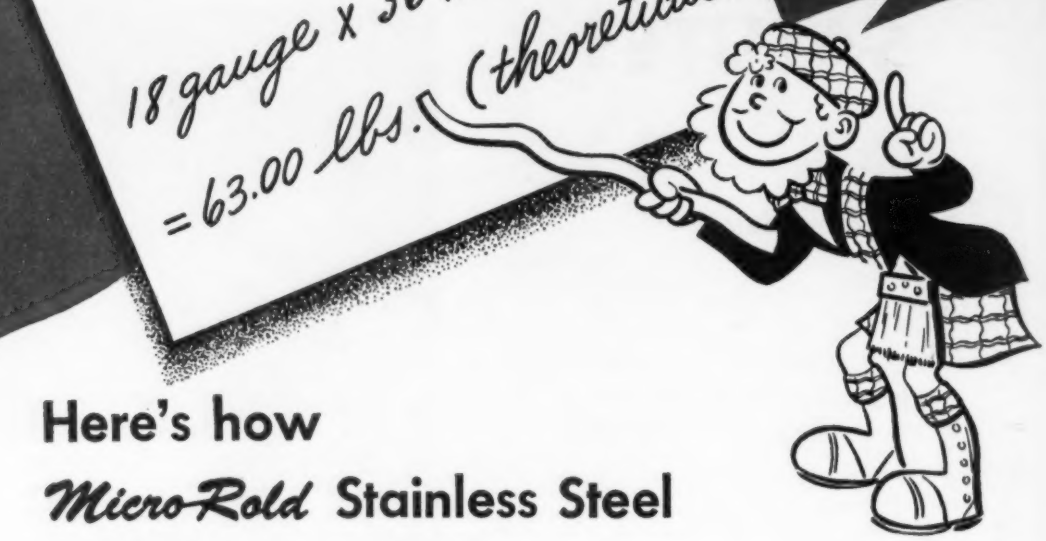
He also served as assistant treasurer for Textron, Inc., in New York for 2 years before taking over as administrative vice-president of Cleveland Pneumatic in 1948.

Since then Cleveland Pneumatic has become perhaps the only large manufacturing plant whose employees' profit sharing trusts are 100 pct owners. Sam Mullin arranged the purchase but he shies away from such labels as "social architect." Instead he emphasizes that profit sharing is just good business.

When he isn't romping with his four children Sam spends his leisure hours gardening and in the basement workshop of his Hunting Valley home.

Job costs ARE FIGURED ON A SQUARE FOOT BASIS

WHILE material IS PURCHASED ON A WEIGHT BASIS



Here's how *MicroRold* Stainless Steel SAVES you money

In the use of stainless steel, the selection of gauge number is usually determined by the minimum permissible thickness having sufficient strength to meet the requirements of the application. When you receive material on the heavy side of the gauge you are paying a premium for stainless surface area.

When sheets are ordered by gauge number, the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. Using a standard 18 gauge 36" x 120" sheet as an example, the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds. Each .001" of thickness adds 1.26 pounds per sheet.

MicroRold sheets may be ordered by gauge number and you can specify they be rolled on the light side of the gauge range. This is true because the equipment is such that more accurate control of thickness is possible.

If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

Washington Steel

CORPORATION

WASHINGTON, PENNSYLVANIA

The Iron Age

INTRODUCES

Richard N. Mathews, elected president, KEWANEE-ROSS OF CANADA LTD., Toronto.

M. Merle Harrod, elected president, THE WAPAKONETA MACHINE CO., Wapakoneta, Ohio. He succeeds the late Carl D. Fischer, Jr.

John A. Deitrich, appointed president, HIND STEEL CO., INC., Union, N. J.

Albert B. Diss, appointed vice-president and general manager, The Watson-Stillman Co., Div. of H. K. PORTER CO., INC., Roselle, N. J.

Francis J. Sehn, appointed vice-president in charge of sales, SAHLIN ENGINEERING CO.

Mack E. Haworth, elected executive vice-president, ALABAMA FLAKE GRAPHITE CO., Birmingham, Ala.

Emil Holzwart, elected vice-president in charge of production, GENERAL BOX CO., Des Plaines, Ill.

John E. Urquhart, becomes president, WOODWARD IRON CO., Birmingham, Ala. He succeeds Bradford C. Colcord, who has retired.

R. C. Somerville, elected vice-president in charge of sales and a member of the board of directors, DODGE BROTHERS CORP., a subsidiary of Chrysler Corp., Detroit.

Mason H. Jones, appointed executive assistant to the president, TEMPEL MFG. CO., Chicago.

R. B. Fuller, will be promoted to assistant to the vice-president in charge of the Phosphate Div., effective July 1, INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago.

F. Garvin Smith, appointed chairman of the board, A. C. LESLIE & CO., LTD., Montreal; and **Charles W. Leslie,** elected president.

Dr. Peter P. Alexander, elected chairman of the board of directors, METAL HYDRIDES, INC.; and **Louis W. Davis,** elected president and general manager.

R. E. Pheiffer, named assistant secretary-treasurer, FARRELL-CHEEK STEEL CO., Sandusky, Ohio; and **J. M. Ritter,** appointed assistant sales manager.

E. W. Barnekoff, appointed director of purchases; TRAILMOBILE INC., Cincinnati; and **W. H. French,** becomes Cincinnati plant purchasing agent.

Howard Winterson, appointed director of industrial relations, BLAW-KNOX CO., Pittsburgh.

Harvey W. Bush, becomes director of manufacturing, THE MORGAN ENGINEERING CO., Alliance, Ohio.

Dr. William F. Ballhaus, appointed chief engineer, NORTHROP AIRCRAFT, INC., Hawthorne, Calif.

Dr. Grayson Kirk, elected to the board of directors, INTERNATIONAL BUSINESS MACHINES CORP., New York. He succeeds the late Augustine L. Humes.

H. B. Montross, Jr., appointed manager of Market Development, U. S. STEEL CORP.

Edward B. Weathers, appointed manager, Chicago district, Major Appliance Div., GENERAL ELECTRIC CO.

Robert S. Sloan, appointed manager of consumer products, WESTINGHOUSE ELECTRIC SUPPLY CO., San Francisco; and **E. E. Morton,** becomes manager of apparatus and supplies, Northern California district.

John W. Schoen, appointed vice-president and general sales manager, R. G. LETOURNEAU, INC., Peoria, Ill.

AUGUST B. HOEFER, elected vice-president, Udylite Corp., Detroit.

DR. MAX M. MULLER, elected vice-president in charge of operations and engineering, Basic Refractories Inc.

CHESTER H. KIMMEL, appointed vice-president and general manager, The Ohio Crankshaft Co., Cleveland.

Personnel

Continued

R. W. Burton, promoted to manager of general services, Warehouse Div., Pittsburgh, JONES & LAUGHLIN STEEL CORP.; **L. C. McGillicuddy,** becomes manager, New York warehouse, **H. B. Asquith,** named sales manager, Detroit Warehouse; **C. J. Pistor,** named resident salesman at Indianapolis for Chicago warehouse; and **T. E. Snyder,** becomes salesman, Cincinnati warehouse.

D. E. Dallman, appointed manager, Minneapolis district, AIR REDUCTION SALES CO.

Eugene F. Allen, named manager, market development & Research Dept., TENNESSEE PRODUCTS & CHEMICAL CORP.

Jack D. Langer, appointed vice-president, SOUTHWEST STEEL CORP., Pittsburgh.

William Goodrich, becomes factory manager, THE DIE SUPPLY CO., Cleveland; **Louis O. Taber,** named customer service manager; and **Arthur Hazeldine,** appointed production control manager.

Durando Miller, Jr., has been promoted assistant technical manager, THE PERMUTIT CO., New York.

M. E. Spicer, named special assistant to the manager, San Diego Div., CONSOLIDATED VULTEE AIRCRAFT CORP.

John Stolarz, named industrial sales manager, DEWALT INC., subsidiary of American Machine & Foundry Co., New York.

Harry P. Neher, Jr., appointed assistant manager, Central Staff Sales Dept., KOPPERS CO., INC., Pittsburgh; **Thomas H. Cable,** appointed manager, Sales Methods Section; and **George C. Miller,** becomes manager, International Product Sales Section.

Warren T. Trask, named assistant manager, Metal Div., NATIONAL LEAD CO.'s St. Louis and Southwestern branches.

George J. Perry, appointed to newly created position of promotion manager, WHITEHEAD METAL PRODUCTS CO., INC.

Oscar A. Pratt, appointed new production control manager, EVANS PRODUCTS CO., Plymouth, Mich.; and **F. H. Harl,** becomes superintendent of Main Plant Production.

HARVEY N. BARRETT, JR., elected vice-president, Basic Refractories Inc.

DR. RALPH A. SCHAEFER, becomes vice-president materials development, Clevite-Brush Development Co.

RICHARD R. SNOW, named assistant to the vice-president of operations, U. S. Steel Corp., American Steel & Wire Div.

ALBERT STEG, appointed controller, Borg-Warner Corp., Chicago.

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Joseph J. DeWindt, named assistant works manager, ALLIS-CHALMERS MFG. CO.; and **G. C. Vogel,** named general superintendent, Norwood, Ohio Works.

H. Bruce Rasmussen, becomes sales manager, MILLER MOTOR CO., Chicago.

Edward H. Berry, promoted to foundry manager and chief metallurgist, DODGE STEEL CO., Philadelphia; and **Henry J. Kelly** becomes chief engineer.

Robert E. Nixon, becomes service engineer, ADAMAS CARBIDE CORP., Harrison, N. J.

Robert G. Morgan, appointed district manager, Moline, Ill., office, Industrial Div., THE TIMKEN ROLLER BEARING CO., Canton, Ohio; and **Robert L. Williams,** appointed district manager, St. Thomas, Ontario, Office.

R. M. Chitwood, named manager, WILLYS-OVERLAND EXPORT CORP., plant division which includes overseas operations.

H. R. Ryan, transferred to Indiana Harbor Works, East Chicago, Ind., as superintendent of new No. 2 Open Hearth Dept., THE YOUNGSTOWN SHEET & TUBE CO., and **Robert Frushour, becomes** superintendent of the Bessemer and Open Hearth Dept., Campbell, Ohio.

L. P. Haverkamp, appointed general plant controller, TRAILMOBILE INC.; and **J. A. O'Toole,** appointed Cincinnati plant controller.

Francis T. Thorley, appointed eastern district manager, HY-PRO TOOL CO., New Bedford, Mass.; **Harry B. Hubbard,** appointed direct factory representative in the state of Connecticut, and **Earl C. Jex, Jr.,** becomes direct representative in Michigan.

Harry W. Bryson, Jr., appointed sales service representative, HOOKER ELECTROCHEMICAL CO., at Tacoma, Wash.

James T. Luscombe, named sales manager, Synchros Div., BECKMAN INSTRUMENTS, INC., South Pasadena, Calif.

Robert L. Werkheiser, named Chicago representative, MONSANTO CHEMICAL CO., Industrial Resins Sales Dept., Springfield, Mass.

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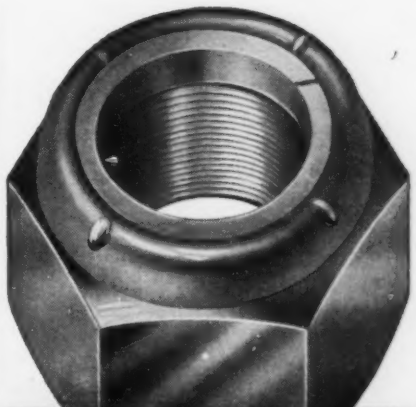

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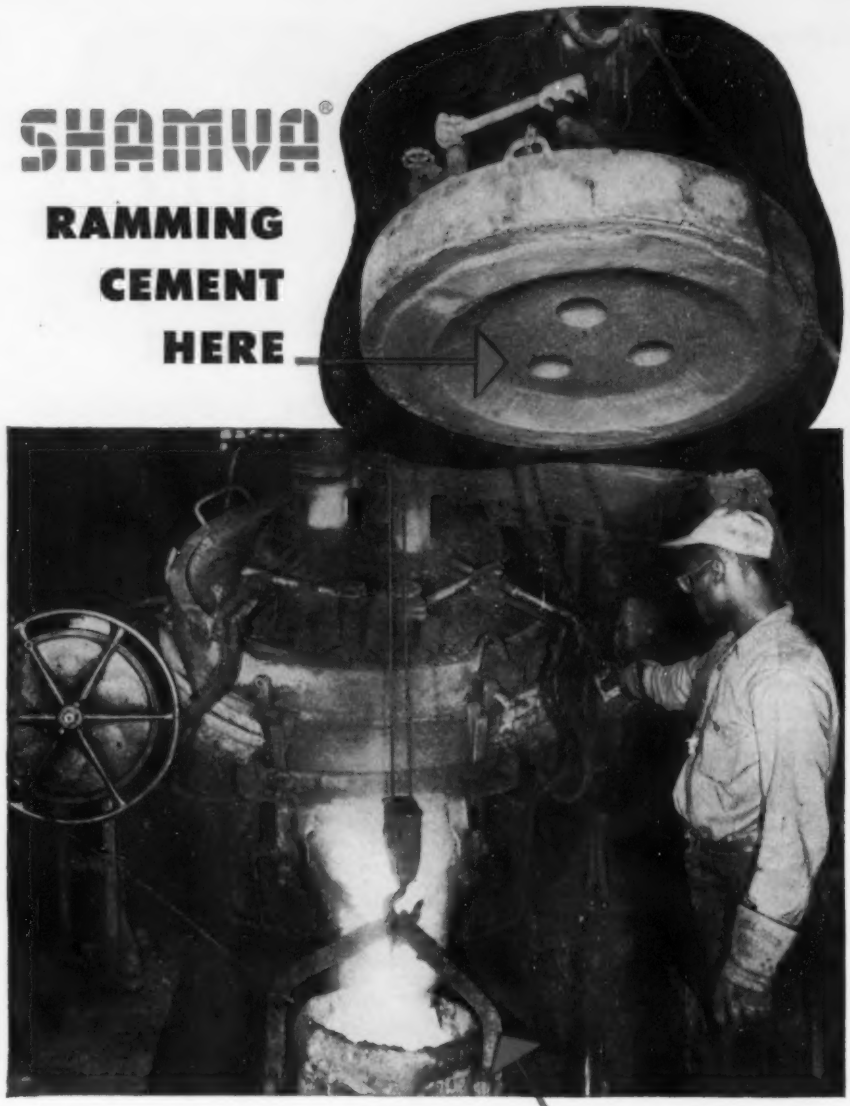

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In Canada, Shamva Products Co., Ltd., Niagara Falls, Ontario.

Personnel

Continued

MONTA O. COX, appointed chief sales engineer, Flodar Corp., Cleveland.

J. C. Woods, appointed division sales manager, THE NATIONAL SUPPLY CO.; and **C. J. Stubble**, becomes division tubular manager, Eastern Div.

Elmer T. Meyer, appointed assistant manager, Agricultural Div., CRUCIBLE STEEL CO. OF AMERICA, Pittsburgh.

John J. Farrell, appointed district manager, West Coast Office, HEVI DUTY ELECTRIC CO.

R. H. Tomlinson, appointed regional representative, GALION ALLSTEEL BODY CO., Galion, Ohio.

Don McLeod, appointed western representative, Los Angeles, OHIO FERRO-ALLOYS CORP., Canton, Ohio.

James P. Creech, appointed Southwest regional representative, CONSOLIDATED INDUSTRIES, INC., West Cheshire, Conn.

Leo Botwin, becomes director of Systems Engineering, KETAY MANUFACTURING CORP., New York.

L. Richard Edgcomb, appointed manager of nonferrous sales, EDGCOMB STEEL CORP., Hillside, New Jersey.

Karl Goetz, appointed manager, San Francisco branch, KURT ORBAN CO.

Harry I. Dixon, appointed New England representative, ALLOY PRECISION CASTINGS CO., Cleveland.

Christian F. Beukema, named general manager of operations of Michigan Limestone Division in Detroit, U. S. STEEL CORP., Cleveland.

Personnel

Continued

JOHN P. DEBRI, appointed general superintendent, Joliet, Ill., plant of U. S. Steel Corp., American Steel & Wire Div.

Robert W. Rost, replaces Robert E. Gentz as superintendent of the Sheet and Galvanizing Department, INLAND STEEL CO., Chicago. **Herbert C. Lieberum** becomes superintendent of labor relations and **Thomas G. Cure** will become assistant superintendent.

L. S. Houk, appointed director of works engineering, WESTINGHOUSE ELECTRIC CORP., Pittsburgh; **N. H. King** becomes director of production and inventory control and **R. I. Wilson,** becomes assistant director of production and inventory control.

OBITUARIES

Richard Knight LeBlond, 88, founder and chairman of the board, The R. K. LeBlond Machine Tool Co., at his home at 3660 Vineyard Place, Cincinnati, recently after an illness of several months.

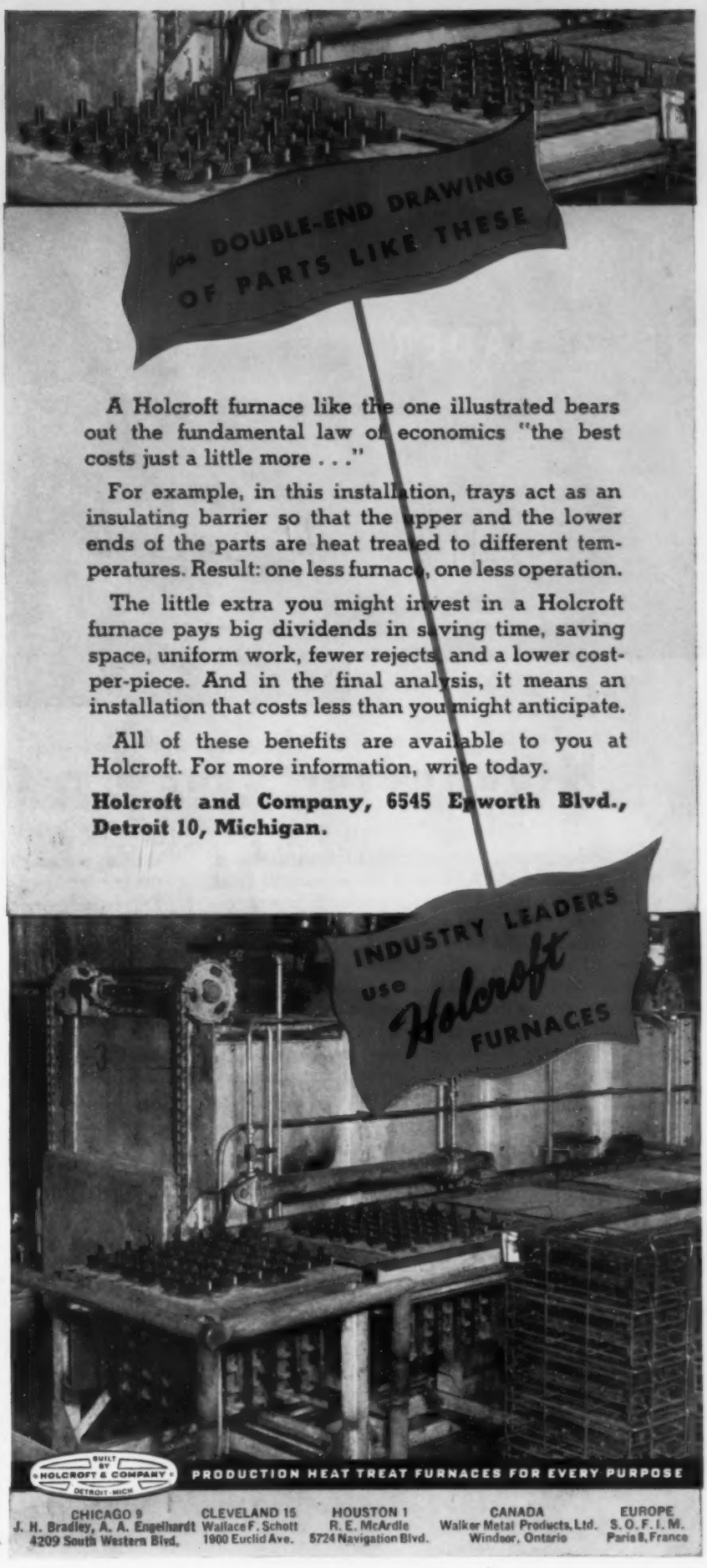
Harld C. Osman, 61, vice-president and sales manager, Crucible Steel Casting Co., Lansdowne, Pa.

Ralph W. Hisey, former vice-president in charge of manufacturing for the Machine Div. of The Osborn Mfg. Co., Cleveland, unexpectedly in the Medina Community Hospital.

Charles Robert Kuehn, 56, assistant treasurer, U. S. Steel Export Co., recently in Muehlenburg Hospital in Plainfield, N. J.

Walter W. Patnoe, 65, chief engineer, Basic Refractories Inc., Cleveland, of a heart attack in his home in Bay Village, Ohio, recently.

Walter E. Dillon, 74, of Framingham, Mass., a founder of the Dillon Machine Works, Lowell, Mass., recently after a long illness.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Technical Articles

A nonferrous hit—

Use Impact Forging FOR TOUGH-TO-MACHINE PARTS

By L. R. Denny
Production Design Engineer
North American Aviation, Inc.
Los Angeles

- Aluminum shapes hard to make by other methods are easily produced by impact forging . . . Impact forging experience is piling up and production results are good.
- Faster production, less material waste, greater economy in machine time and labor are possible . . . Impact forgings have been produced in 2S, 52S, 61S and 14S alloys.
- Mechanical properties of impact forgings are the same as for regular die forgings . . . The method pays off on smaller orders too where complicated shapes and unsymmetrical designs make regular machining methods costly . . . Grain direction is refined and strength usually improved.

◆ IMPROVEMENT IN the fabrication of shell cases, boxes, symmetrical containers and deep-drawn parts has been made by the impact forging process. Most progress has been made in this cold forming process by the ammunition manufacturers. Starting with a carefully-sized cylindrical billet, a large shell case is produced by successive extruding and upsetting without machining except for final threading operations.

The method and design considerations for impact forging of aluminum alloys along similar lines are of major importance to the design engineer. In many cases, impact forging offers faster production, less waste and greater economy than other methods of fabrication.

A carefully-sized blank is placed in a die cavity. A punch is forced into the die cavity under extremely high pressures, causing the blank to extrude either forward through a hole in the die (away from the punch) or backward (up and around the punch). The blank is thus cold-worked to shape with the improvement in mechanical properties and refined grain flow typical of other types of forgings.

Cutaway sections of impact forging tools are diagrammed in Fig. 1. The impact forging set-up illustrated in Fig. 2 shows the die, stripper plate, punch, and blank shape required to produce a can type part. This is a backward extruding die, hence the necessity for the stripper. The blank size plus the depth of stroke of the punch determines the length of the completed

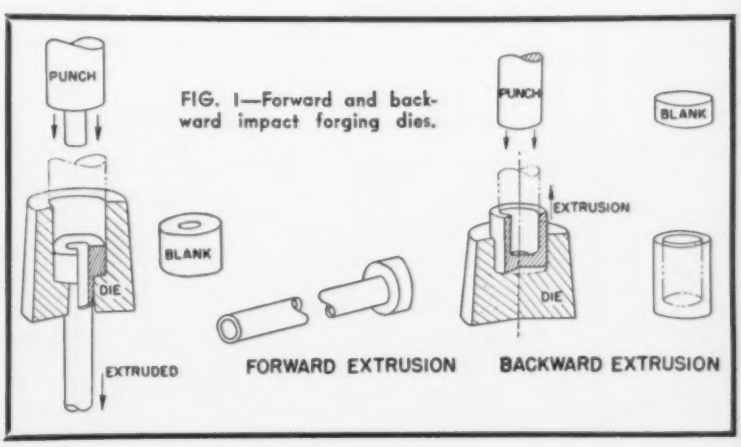

FIG. 1—Forward and backward impact forging dies.

Impact forging pays off on short run quantities where shapes and design are more complicated . . .

can. As a deep-drawn shape this part, one of six required per wing in three different heights, was made in stages on three dies with intermediate annealing operations.

In general, nearly any cylindrical "can" shape may be impact forged or turned on a lathe. Hence, the breakeven point in quantity depends upon the length of the part (machining time and material) die cost and material saved. Thus, a short part of 4-in. length, 4-in. flange diameter and 2-in. body diameter, may cost less if made by turning unless quantity runs very high. It is in the more complicated shapes like rectangular cans, unsymmetrical designs, and unequal wall thicknesses that impact forging pays off on lower quantities.

Fig. 3 shows such a piece, rectangular in shape with thick bottom, which is cut in half to make two "bathtub" type fittings. This is impact forged without the draft angle necessary to conventional die forging, thereby eliminating the machining and fixtures required to remove draft. In Fig. 4 the short box shape, forged without draft, incorporates the flat diameter or "register" at the bottom of the box necessary for bolt attachment. Although the 15° angle between register and side wall varies in planview area from the side to the corner of the box, the symmetry of shape is maintained and no difficulty is encountered in impact forging.

Nonsymmetrical shapes are illustrated by Fig.

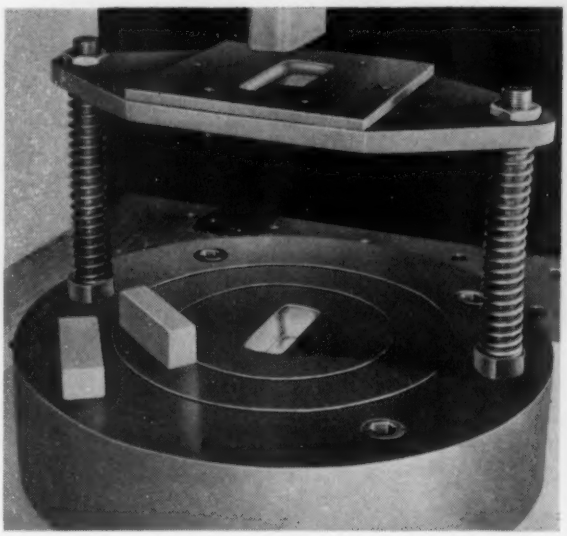

FIG. 2—Die produces can-type part from blank shown. Stripper plate removes can from punch.

ALUMINUM IMPACT FORGING LIMITS

Height, backward extrusion	16 in. max
Length, forward extrusion	22 in. max
Punch, max length	6 times punch thickness
Wall thickness	0.060 in. min for 2S, 52S, 61S and 14S-T4; 0.125 in. min for 14S-T6
Bottom thickness	Min, 2 times wall thickness
Flange thickness	Min, equal to wall thickness
Vertical corner radius	0.125 in. min, preferably 0.250 in.
Bottom angle	15°
Outside bottom radius:	
Can type	No minimum. Preferably zero radius for thick bottoms
Flange type	0 to 0.250 in.; preferably 0.020 to 0.060 in.
Inside bottom radius:	
Can type	0.010 to 0.30 in. for wall thicknesses 0.060 to 0.125 in. preferred 0.030 to 0.300 in. for wall thicknesses over 0.125 in., 1/16 in. preferred
Flange type	0 to 0.250 in., preferably 0.20 to 0.060 in.
Bottom area	16 sq in. max

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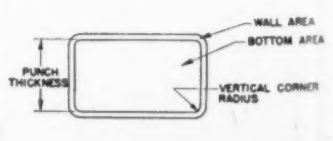


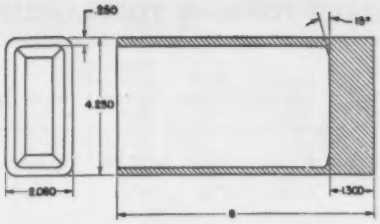


FIG. 3—Bathtub type fitting is impact forged without draft angle necessary for conventional die forging. Can is cut in half to make two parts.

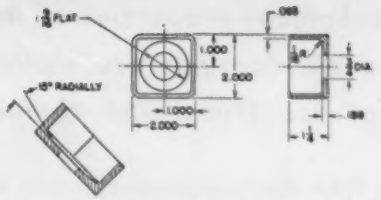


FIG. 4—Short box shape, forged without draft, incorporates "register" at bottom for bolt attachment.

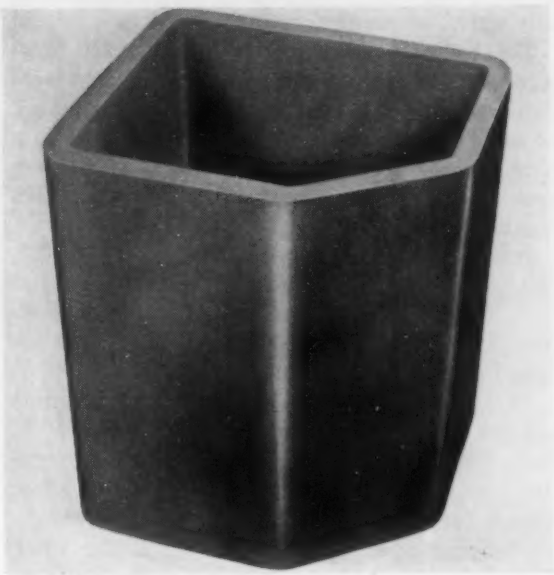


FIG. 5—Nonsymmetrical shapes with varying wall thicknesses are easily produced by impact forging.

5, one of these being of varying wall thickness. This type of design is submitted to the forging vendor for approval, as are those in Fig. 6. The latter are more easily impact forged since variation in wall thickness is symmetrically located. In either case, machining these shapes would be impractical. Lack of symmetry in a design produces unequal metal flow from one side of the part to the other, tending to deflect the punch. Fig. 7 shows design recommendations for improved metal flow. Unequal flow results in improper wall thicknesses and variations in height of the walls. Best results are obtained by incorporating a centrally located boss or point to impede deflection of the punch.

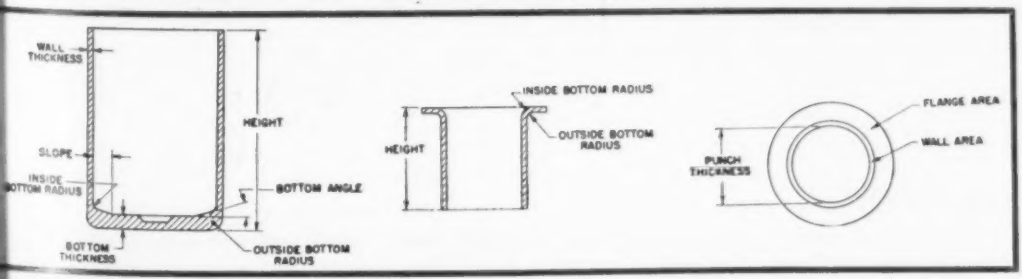
Make thin-walled parts

The flanged tubular shapes, Fig. 8, forward extruded, do not usually have the dimensional variation expected in "can" designs. The walls attain a mirror-like finish and extraordinarily long pieces may be extruded with very thin walls. Additional economies in weight and fabrication costs may be made by trimming the flanges to shape in blanking dies. Grain direction is refined by impact forging, often in a direction beneficial to the structural use of the forging.

Some other impact forged shapes are shown in Fig. 9. At "A" the rectangular box is shown cut into four corner fittings. A splayed fitting "B" can be forged by impact. Its shape is such that expensive types of milling fixtures are required for machining, hence a saving can be made by forging followed by forming. At "C" is shown a flat plate with bosses raised by impact extruding. These may be peened over or otherwise used for fastening two parts together.

Impact forging is usually done by forge shops that do not perform other methods of fabricating such as machining or punch press forming.

WHERE COMMON IMPACT FORGING TERMS APPLY



Mechanical properties of impact and die forgings are similar except for transverse elongation.

Hence in NAA drafting practice, impact forging is treated as die forging, with a "rough forging" part of the drawing and finished part shown on the other end. The forging vendor then bids only upon the rough forging part of it.

These illustrations show typical impact forgings made by North American Aviation and local vendors. Production experience has been limited on some types and sizes; therefore, the following comments on properties, tolerances, and size are general and may be changed as more production experience is obtained.

Impact forgings have been produced in 2S, 52S, 61S and 14S alloys. Some experimental work on impact forgings in 75S alloy has been done, but production drawings should not be released calling for this alloy.

The mechanical properties of impact forgings are the same as regular die forgings with the exception of transverse elongation. The elongation has ranged from 6 to 12 pct on 14S alloy. Impact forging drawings should carry the regular forging Spec. QQ-A-367 Class 5 for 14ST designs with an extra note giving minimum elongation of 6 pct.

Expect closer tolerances

Bottom thickness, wall thickness, length and type of part all have a marked influence on the dimensional variation of a particular design. The table of tolerances is necessarily general and as development work continues, closer working tolerances may be expected.

In aluminum alloys the maximum reduction by alloy are: 2S, 95 pct; 61S, 90 pct; 14S, 85 pct. This may be calculated by the formula: Percent of reduction $=100\ (1-\frac{Aw}{Ab})$, where Aw equals the cross-sectional area of wall and Ab equals the bottom of flange area. This formula applies equally to both backward and forward types of forgings.

IMPACT FORGING TOLERANCES

	Bottom Thickness in in.	Wall Thickness in in.	Width, Length or Diameter in in.	Height in in.	Angular Deg
Flange Type	±0.020	±0.010	±0.020	±1/16	±1/2°
Rectangular Can	±1/32	±0.015	±1/32	±1/16	±1/2°
Contour	±1/32	±1/32	±1/32	±1/16	±1/2°

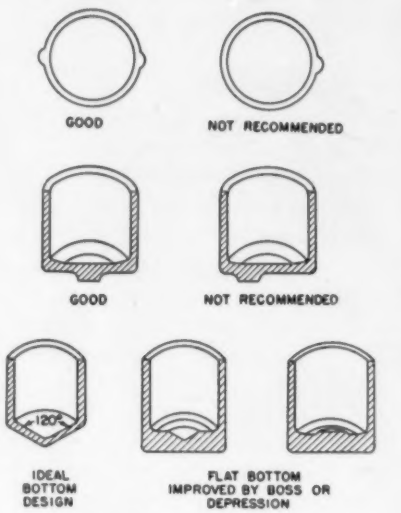


FIG. 7—Recommended design features for impact forging. Symmetrical design aids metal flow.

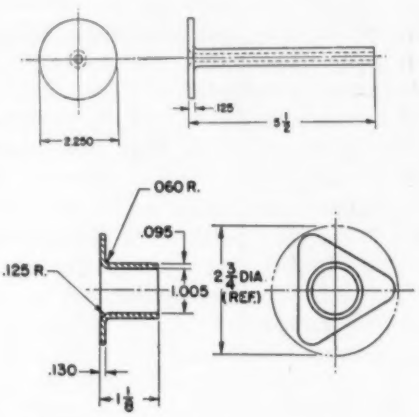


FIG. 8—Forward-extruded flanged tubular shapes usually do not have dimensional variations found in can design.

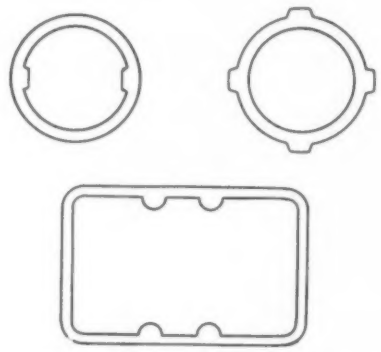


FIG. 6—Symmetrical location of wall thickness variations simplifies production of impact forgings.

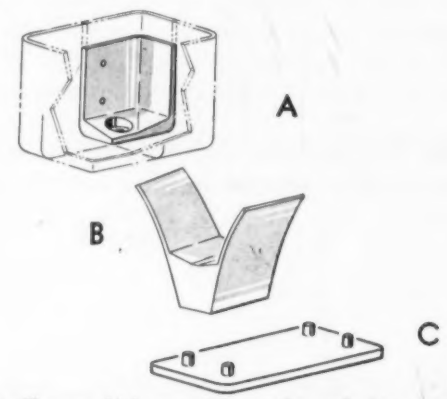


FIG. 9—Shapes which cannot be easily made by normal machining methods can be produced by impact forging.

And in steel too—

IMPACT FORGING Can Save You Money

By Frank J. Pesak
Tool Engineer
North American Aviation, Inc.
Los Angeles

◆ STEEL IMPACT FORGINGS are being produced by the same techniques used to make nonferrous metals. Conventional drawing methods stress the metal by tension. Impact forging, however, enhances metal structure by producing details stressed in compression. Metal in such parts is superior to that in drawn shapes and equal in grain flow structure to press forgings.

Impact forgings of carbon steels in the SAE 1010-1020 range are most common. Tooling problems met in impact forging of alloy steels such as SAE 4130—lower tool efficiency resulting from excessive operating pressures—are not as apparent in the low carbon steels. Approximately 300,000 psi pressure is required to start backward metal flow in mild carbon steels.

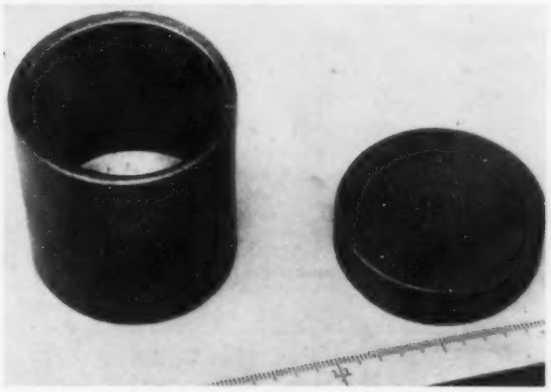
In both low carbon and alloy steels, for practical tooling reasons, the limits of size and percentage of reduction of extruded detail are far below that possible with nonferrous metals. Closed end tubular sections of SAE 1020 steel can, however, be forged to a ratio of approximately 1 to 3—diameter to length. Reductions up to 80 pct are possible in one stroke at room temperature. Ram speeds may vary from 3 to 6 ipm.

Further reductions of the same detail, to 95 pct, are possible by progressive working. Interstage annealing removes work hardening and improves flow characteristics of the metal. Ideal hardness of the low carbon steel slug or billet is below RB 70. Hardness should not exceed RB 90 for proper tooling efficiency.

Less reduction per stroke is possible with SAE 4130 steel. Isothermal annealing of this material to attain the minimum hardness range, approximately RB 87, is necessary. Preheating the slugs or billets reduces forging operating pressures and increases flow characteristics. Application of heat, however, introduces conditions which directly affect detail finishes.

Proper deposition of an adequate lubricant is a major prerequisite. Lubricants permit lower operating pressures, decrease tool wear by aiding metal flow, and permit lower stripping and ejection pressures. Lubricants must perform efficiently at high temperatures. Heat is generated in the forging of steel, with temperatures rising from 550° to 600°F. Acceptable results are being achieved with phosphate coatings in conjunction with lubricants such as molybdenum-disulfide or soaps.

Punch and die designs are similar to those used to extrude nonferrous metals. The die section designs offer a variety of fabrication methods to produce required results. The most widely used design incorporates the die ring and knockout construction. This affords definite mechanical ejection with economical tool replacement. Segmented die construction proved to be most economical for difficult shapes. Closed cavity type dies on the other hand produce flash-free products. In all cases, however, the die cavity sections are preloaded under pressures to 60,000 psi exerted by a heavy shrink ring. General rules governing product design of aluminum apply to design of steel parts.



STEEL IMPACT EXTRUSION made from SAE 4130. Reduction is 85 pct. Phosphate coated slug is preheated to 600°F, lubricated with molybdenum-disulfide and wax. Closed cavity die yields sharp outside bottom radius.

In 52100—

VACUUM MELTING

- Better fatigue life and improved impact properties have been found in samples of vacuum-melted 52100 compared with commercial 52100 steel.
- Extra metal cleanliness attained with the vacuum-melted metal is an important factor in improved properties.
- Production vacuum-melting furnaces can turn out melts of 1200 lb in nonferrous metals such as high purity copper and beryllium copper . . . Melts to 600 lb in steels and high temperature alloys are attained in production.

By James H. Moore
Director
Metallurgical Dept.
National Research Corp.
Cambridge, Mass.

◆ VACUUM-MELTING furnaces now in use yield production melts up to 1200 lb in nonferrous metals such as high purity and beryllium copper, and to 600 lb in steels and high temperature alloys. Increasing availability of these metals has prompted National Research Corp., Cambridge, Mass., and its subsidiary, Vacuum Metals Corp., sole commercial supplier of vacuum melted alloys, to study further applications for these metals.

Analysis of probable fields for application of vacuum-melted materials showed that alloys requiring very high impact or fatigue properties would merit closer study. One such alloy, 52,100 steel, is widely used in the manufacture of bearings.

Fatigue life of such bearings is subject to considerable variation, which may amount to a factor of 50 or more. An investigation* of the fatigue behavior of a vacuum-melted sample of 52100 steel originally melted by National Research Corp. reported a definite improvement in fatigue life. Scatter, however, was not considered to have been improved.

*H. Styri, Fatigue Strength of Ball Bearing Races and Heat Treated 52100 Steel Specimens. ASTM Preprint, Nov. 23, 1951.

Since this work primarily studied factors other than improvement in cleanliness by vacuum melting, Y. P. Dardel and Frank L. Carr, of National Research Corp., undertook a comparison of the fatigue properties of normal commercial and vacuum-melted 52100 steels.

A vacuum-melted heat was selected with chemical composition close to a sample from a commercial heat supplied by SKF Industries, Inc., Table I.

The commercial material was in the form of ¾-in. diam rod in the spheroidized condition. The vacuum-melted material was hot worked from 3 in. to ¾ in. diam, normalized for 1 hr at 1652°F, air cooled and then spheroidized. Spheroidization practice was checked carefully to insure duplication of the fine spheroidized structure present in the commercial heat. The ¾-in. diam rods were then taken through machining and heat treatment together.

Standard rotating beam fatigue specimens were rough machined to 0.010 in. oversize on all diameters. They were heat treated by holding ½ hr in cast iron chips at 1612°F, oil quenched in Gulf Super Quench at 181°F, tempered in cast iron chips for 1 hr at 411°F and air cooled.

How clean is the metal?

Grain size was close to ASTM No. 6 for both steels, and final hardness was 60 Rc for each. Specimens were then wet-ground longitudinally on a surface grinder with the specimen rotating at 100 rpm and the wheel at 3200 rpm, to a 10 microinch finish. They were finished to 2 microinches on a lathe, using Alundum paper and a longitudinal polish with levigated alumina.

With this careful treatment to insure metallurgical and physical uniformity in both lots of material, there existed only one outstanding variable, the cleanliness of the structures of the two steels.

This was checked by taking random samples from the bar stock and making a metallographic

Lengthens Fatigue Life, Improves Impact Properties

determination of the inclusion content at 100X according to ASTM Tentative Recommended Practice E45-46T, using the Jernkonatoret comparative chart. The results are shown in Table II for the commercial heat.

In the case of the vacuum-melted steel, no comparative inclusion measurement could be made at 100X because of the metal's cleanness.

Fatigue testing was performed in a Krouse rotating beam machine. Results are plotted in Fig. 1. No fatigue limit was obtained for either the commercial or vacuum-melted steels in the stress range covered. However, a marked difference in fatigue life was evident. The mean S-N curve for the vacuum-cast material is two orders of magnitude greater in cycles to rupture at lower stresses than that of the conventional material. The difference goes to three orders at higher stresses. In terms of stress, this means about a 50 pct increase at the same life.

More data are needed for a good analysis of

TABLE I

ANALYSES OF TEST MATERIALS

	Ferrovac* 52100 Pct	Commercial 52100 Pct
Carbon	1.03	1.04
Chromium	1.50	1.47
Manganese	0.35	0.37
Silicon	0.27	0.25
Sulfur	0.011	0.011
Phosphorus	0.001	0.006

* Trademark, Vacuum Metals Corp.

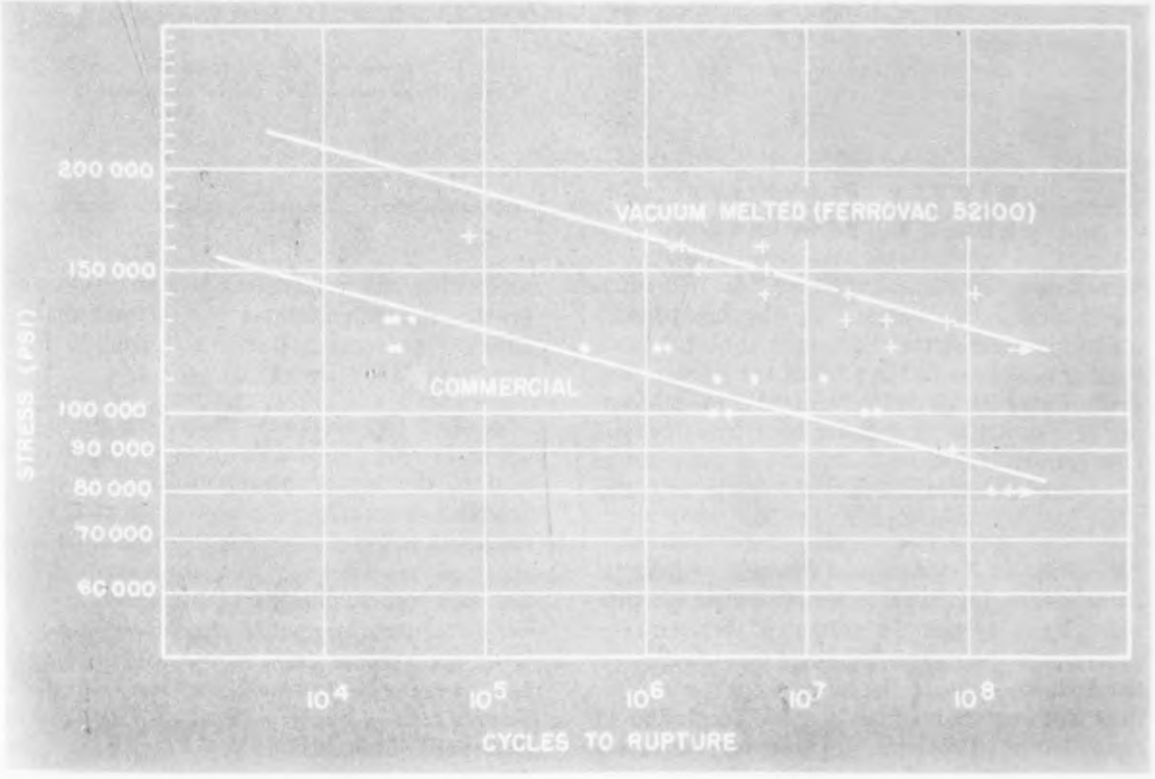
TABLE II

CLEANLINESS OF 52100 STEEL*

Inclusion Type	Thin	Thick
A. Sulfide	less than 1	...
B. Alumina	2	...
C. Silicate	1	...
D. Globular	1½	1½

* ASTM Commercial Classification.

FIG. 1—Marked difference in fatigue life of vacuum melted and commercial 52100 was found after tests in rotating beam machine. In terms of stress, this means about a 50 pct increase at the same life.



"A small but definite difference in impact properties was found in the vacuum-melted steel . . ."

the spread in fatigue life. However, statistical analysis indicates the dispersion of data for commercial steel to be about 57 pct greater than that for vacuum-cast steel.

A small but definite difference in impact behavior was also found in the vacuum-melted steel. Fig. 2 gives the impact transition curves for the two steels in the range from room temperature to 300°F.

Although impact strength of both steels is very low, drop in impact energy occurs in the commercial steel at about 200°F. In the vacuum-melted steel it occurs at about 100°F.

Since making this study, a number of production heats have been made in the furnace, Fig. 3, pictured during tapping. Production melting techniques have been worked out, and inspection procedures developed.

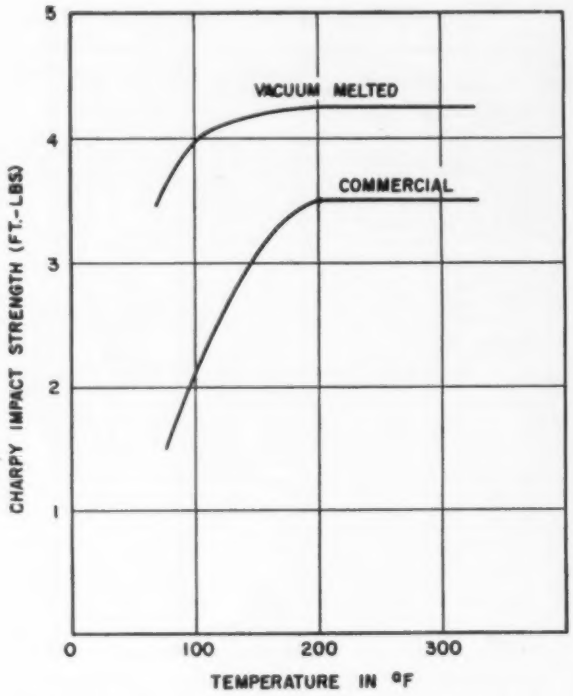


FIG. 2—Comparison of notch impact strength shows drop in impact energy for vacuum-melted 52100 starts at about 100° F, compared with 200° F for the commercially melted product.

FIG. 3—Tapping heat in vacuum-melting furnace. Production techniques include special checks for cleanness.

NEW BOOKS

"Executive Pay Plans, 1952-1953," by William J. Casey and J. K. Lasser. In "buying power," highly paid executives have been squeezed down further each year by the present tax system. The authors give advice on the financial care and feeding of executives. A valuable study which shows how various companies have handled the problem of paying executives. Business Reports, Inc., 225 West 34th St., New York 1. $12.50. 160 p.

"Minerals—A Key to Soviet Power," by Demitri B. Shimkin. Insight into Soviet policies is provided by a systematic survey of mineral resources and their production and consumption by the Soviets. Bulk of the volume deals with ferrous and nonferrous metals, gold, the fuels and nonmetallics. Problems of adequacy of Soviet production and reserves as related to economic growth and potentialities for self-sufficiency to 1970 are presented. Harvard University Press, Cambridge 38, Mass. $8.00. 452 p.

"Reaching Out in Management," by William B. Given, Jr. A successful business executive, chairman of the board, American Brake Shoe Co., describes successful administrative methods he has applied. Foundation for these methods is the policy of "reaching out" to enable every employee find personal fulfillment in his work. Building self-confidence, improving communications at all levels, and encouraging every man to discover the full range of his capacities have been Mr. Given's aims. Harper & Bros., 49 East 33rd St., New York. $2.50. 175 p.

Blow the chips—

BETTER CHIP HANDLING In and Out of the Plant

◆ In building the Buick V-8 engine plant considerable attention was given to chip handling facilities . . . Conveyers, including some below floor, handle chips from gray-iron castings.

◆ Steel chips are crushed and blown into storage bins by a pneumatic system . . . Overhead bins discharge scrap into cars located on a siding below . . . Facilities are well housed.

By Herbert Chase
Consultant
Forest Hills, N. Y.

Fig. 1—A transfer point where gray-iron chips, moved by channel conveyers below machines, are transferred into main transverse conveyer in a trench.

◆ CHIP HANDLING at the new Buick V-8 engine plant is done rapidly and efficiently by means of conveyers, trackless trains and pneumatic equipment. Where castings are machined, chip disposal is entirely conveyerized. In other areas the carrying capacity of trackless trains is sufficient to permit a minimum of interference with production. This modern chip-disposal system makes possible easier chip handling and segregation, lower labor costs, better scrap protection and improved safety and working conditions.

Chips from gray-iron castings which account for the most volume are handled most effectively by conveyers. Machine tools used in machining the castings are located either directly above a chip conveyer or are equipped with chutes which feed them to a conveyer. Primary conveyers travel mostly in above-floor channels but feed into a main transverse conveyer located beneath the floor, see Fig. 1.

The main conveyer discharges at one end of

MR. CHASE, engineer, former trade magazine editor and author of engineering texts is noted for his articles on the latest industrial developments.

Bins have sloping bottoms . . . Chutes open upon a railroad siding below . . .

the building into a hopper located at the base of a bucket elevator. Chips are then carried vertically and discharged into pipes which feed them into large overhead-storage bins. General arrangement of conveyers and equipment for handling gray-iron chips is shown in Fig. 2.

The storage bins are located inside the building in an above-ground extension, see Fig. 3. Bins have sloping bottoms ending in discharge chutes which open upon a railroad siding below. Gondola cars are spotted below the discharge chutes for easy loading. Both the loading and unloading of the storage bins are controlled within the building. This prevents chip freezing, possible with open bins in cold weather, and contributes to safer and more comfortable working conditions.

Steel turnings, not well adapted to conveyerized handling, are removed from machining areas in trackless trains of side-dumping trailers, towed by industrial trucks, see Fig. 4. Each machine has adequate storage space so that frequent pickups are unnecessary. Chip removal is on a fixed schedule so little disruption of production is created. Trailers are hand loaded and alloy and carbon-steel turnings are segregated. When loaded, chips are carried to dumping points in the storage-bin area.

Carbon-steel turnings, also handled by trailers, are dumped into crusher chutes and fed by gravity into motor-driven crushers, shown in Fig. 5. They are then broken up and discharged into a pneumatic-conveyer system which carries them upward into hopper bins. This method of handling has proved highly satisfactory since

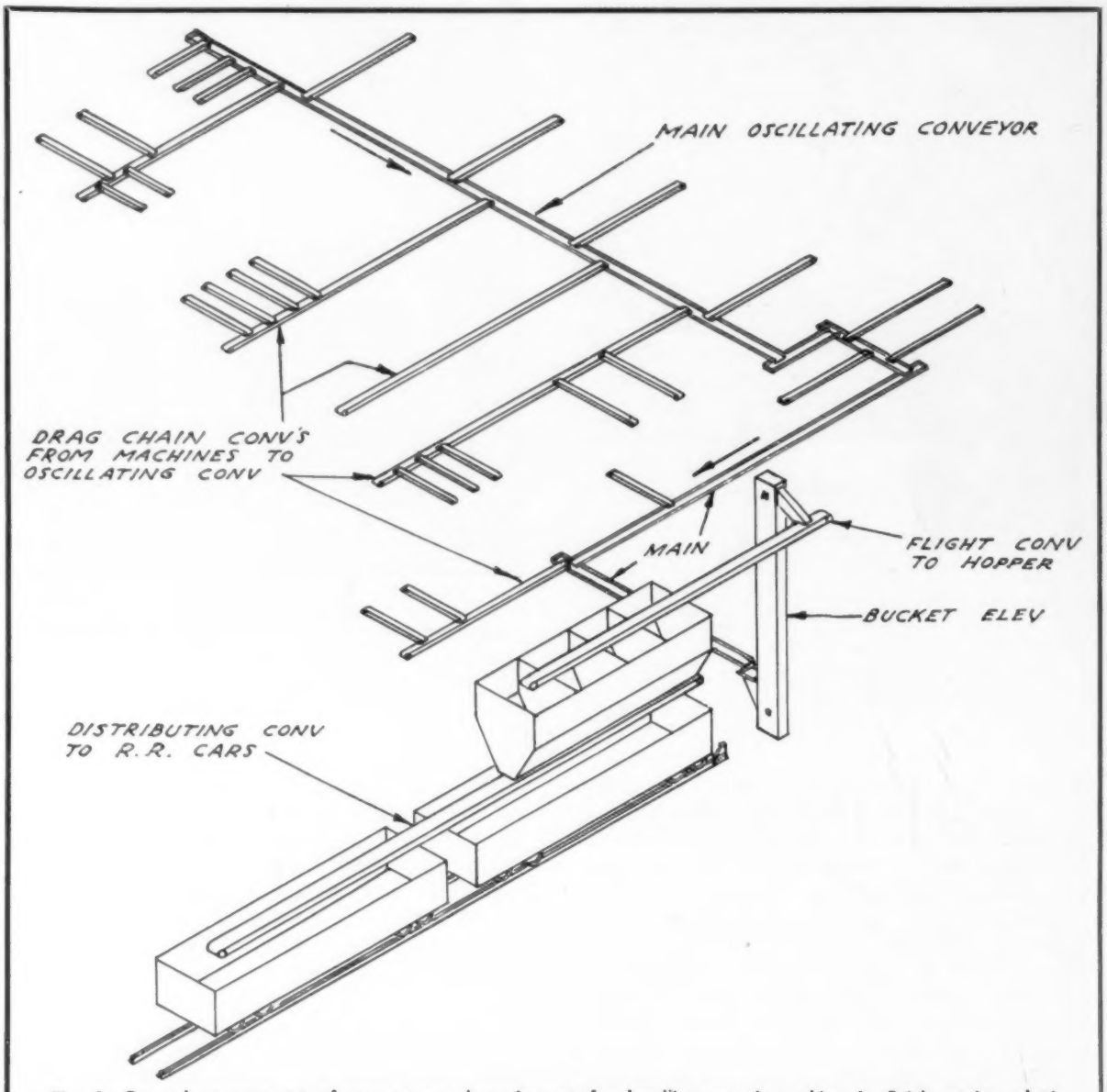


Fig. 2—General arrangement of conveyers and equipment for handling gray-iron chips in Buick engine plant.

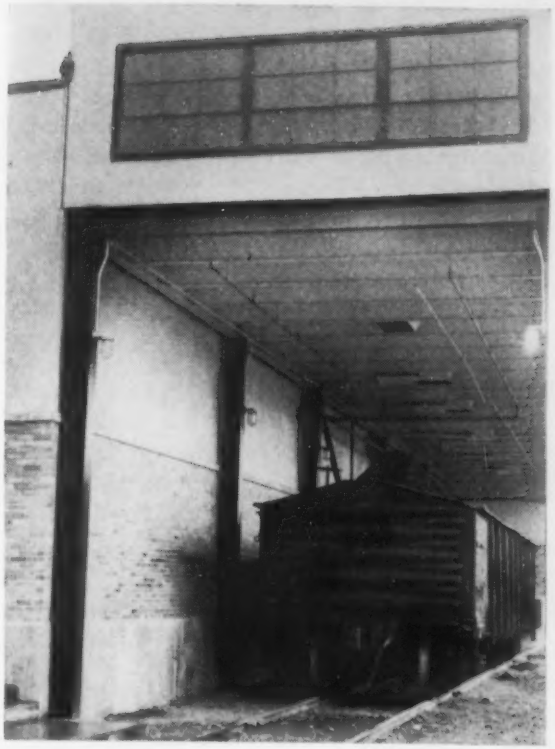


Fig. 3—Gondola spotted on siding below a row of high-level storage bins. Three chutes above each car make more uniform loading possible.

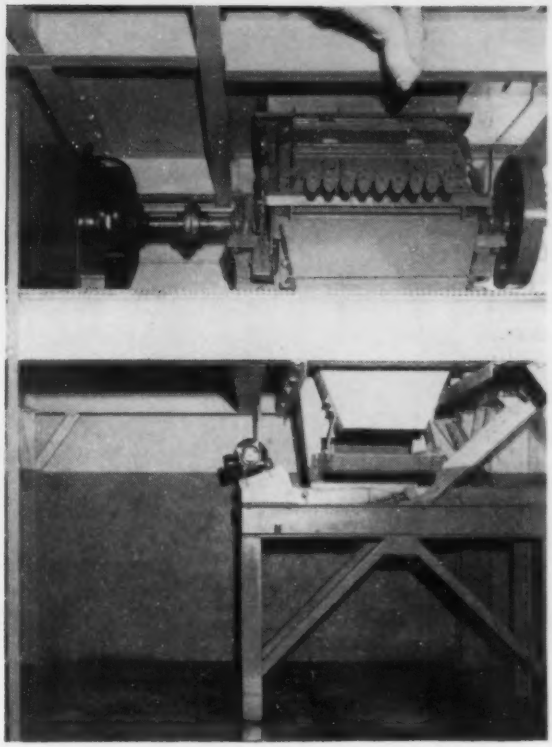


Fig. 5—Carbon steel turnings from the motor-driven crusher, above, are fed into pneumatic system which carries them upward into hopper bins.

Fig. 4—Chips are loaded into dumping trailers and transferred to a chute which feeds crushers.

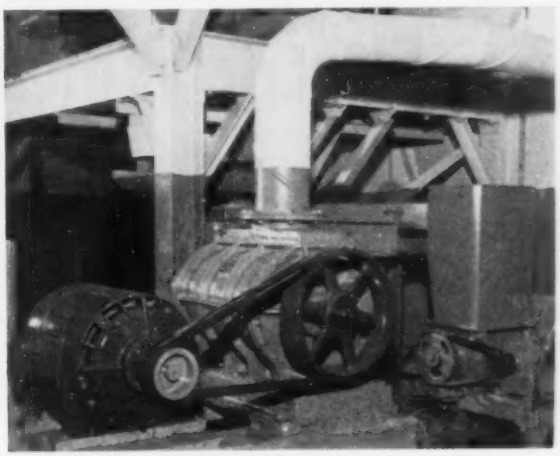


Fig. 6—Motor-driven blower which supplies air for carrying chips into high-level storage bins.

the cost of maintaining this type of equipment is low. Gray-iron chips are not broken up and blown because this would cause a bad dust condition.

Blowing is done by the high-pressure blower shown in Fig. 6. The piping is arranged so that distribution to hopper bins is easily controlled. Each bin is filled from two discharge pipes so that chips fill its entire length. Bin discharge is controlled by gates at the bottom of each bin. Three openings above each gondola car permit more uniform loading.

Alloy-steel turnings stored in outside bins adjacent to a rail siding are segregated according to the different types of alloys. Since their volume is not great the bins are small and unloaded infrequently. A diesel crane equipped with a magnet unloads this scrap into gondolas when a car or more has been collected. Nonferrous chips and turnings, mostly aluminum alloy are handled in the same manner as carbon-steel chips. After crushing they are blown into a high-level bin and stored. When sufficient quantities have been accumulated the aluminum chips are discharged into open-top trucks and sold to aluminum refiners for remelting.

Welders have more ulcers.

◆ Use proper safety equipment and simple safety practices to cut health hazards incident to electric arcwelding.

◆ Protect eyes from painful eye flash by using proper helmets and goggles . . . Cut respiratory irritations by using proper exhaust equipment and venting to eliminate welding smoke.

By Dr. W. Schweisheimer
Highland Hall
Rye, N. Y.

Make YOUR Electric Welding Operations Safer

◆ HEALTH HAZARDS in welding operations are relatively few. If proper safety rules are applied, and protective equipment used even these hazards can be guarded against. Eyes, lungs and throat, and the stomach are the principal areas affected in welding operations.

Electric welding arcs give off infrared radiation, visible light of high intensity, ultraviolet radiation, heat, and fumes from metals and fluxes. Looking at the arc for only a few seconds can cause a painful "eye flash" which does not appear immediately. In such cases relief may be had by protecting the eyes from light and covering them with a cloth frequently wrung out in cold water. Eye drops at the beginning of treatment may reduce discomfort.

Blindness among welders is probably no more frequent than among workers in kindred mechanical trades, the Journal of the American Medical Assn. recently pointed out. Lesser eye injuries, however, *are* far more frequent. Mechanical injury is the chief cause of total blindness.

Ultraviolet radiation leads to flash injuries with painful damage to the eye, but less than 1 pct of ultraviolet rays penetrate to the interior of the eye.

Infrared rays, about 69 pct of the total radiation of arc flash, enter the deeper eye to the extent of about 12 pct. The usual protection against the more active ultraviolet rays does not always exclude infrared rays. Occasionally, though rarely, cataracts develop. A cataract is an eye disorder in which the pupil, usually black and transparent, becomes colored and opaque. This type cataract also occurs among glass workers.

Goggles and hoods give adequate protection against flash burn of the eyes. Chief complaint in eye flash from arcwelding is pain in one or both eyes, accompanied by the feeling of having a foreign body in the eye such as sand. With

DR. W. SCHWEISHEIMER received his medical training in Germany and New York. For many years he has written on popular medicine and industrial hygiene for newspapers and magazines.

proper care these discomforts disappear, usually within 24 to 48 hr.

Eyes can be protected from infrared rays by ferric oxide lenses which filter out most harmful radiations. In some cases, a higher level of plant illumination will offset the disadvantage of dark glasses.

It is not the welder, however, who is the most frequent victim of his own arc, but the person working near him. The welder protects himself with a hood. He may receive a flash injury from another welder's arc or from his own arc accidentally struck while his hood is raised. Minimal safe distance to a welder's arc without goggle protection is 200 ft.

Welding fumes may produce acute and chronic changes in the lungs. Air masks and exhaust hoods give protection against the fumes but are not used extensively. While many welders do not like to use respiratory masks, these masks do give effective protection when welding in a confined and poorly ventilated space, in boilers and tanks. Most effective treatment is to end exposure to welding fumes.

Welding smoke is composed of ozone, nitrogen oxides, asbestos and iron particles less than 0.5 microns in diam. Smoke composition varies with the type of metal being welded.

Ventilation must be adequate to remove the fumes given off during welding. Fumes are a special problem when welding is performed in a small confined space. Generally, mechanical ventilation should draw a current of fresh air across from the worker towards the work.

Inhalation of zinc fumes given off during welding of galvanized metals may cause acute but transitory chills. Particular precautions should be taken when metals, electrodes or fluxes containing lead, manganese, cadmium or other poisonous metals are used.

There's no substitute for good clean air.

Concentration of nitrogen oxides in the atmosphere of welders' workplaces are a problem. One survey found lowest concentrations of nitrous gases in the middle of workrooms under normal conditions. In winter, when the workroom was closed, average concentrations rose five-fold. Cheapest way to lower the concentration of nitrous oxide is to use a horizontally directed natural draft. Vertical drafts may carry considerable amounts of nitrous oxide to crane drivers. Draft intensity should be low enough to avoid physical discomfort. Mechanical exhaust systems lower nitrous oxide concentrations substantially.

Exhaust equipment aids efficiency

Installation of local exhaust equipment has been found to increase the welder's efficiency while removing contaminating dusts, fumes and gases at their point of origin. Respirators are not recommended for constant day-long use at most jobs. Caution must be taken when using general supply ventilation alone where welding operations are in progress.

Stomach and other digestive disturbances are frequent among welders particularly in comparison with other industrial occupations. The changing weekly shift is an important influence in the prevalence of stomach troubles. Any welder whose working hours make it hard to avoid certain irregularities in living conditions, especially with changing eating habits, should take special care of his digestive organs. Many physicians advise welders to drink plenty of milk, both as a preventive measure against stomach troubles and for treatment of existing complaints.

Many have stomach trouble

In Germany a study was made recently of complaints of electrowelders who believed their stomach troubles were caused by their occupational activity. Ulcers of the stomach or the duodenum, first part of the intestines, were found in 10 pct of the X-ray controlled cases. A catarrh of the stomach, gastritis, was found in 39 pct of the cases.

Electrowelders generally have more ulcers of the digestive organs than persons in other occupations. Both manganese and arsenic with which electrowelders come in contact, have been held responsible for such ailments.

Another medical observer found digestive troubles in 37.3 pct of electrowelders examined. No particularly high incidence of digestive troubles was found among oxyacetylene welders. American statistics record a low 2.2 pct of cases of stomach ulcers among metalworkers.

Vice versa—

What the *FERROUS METALLURGIST* Should Know About Titanium

◆ Titanium cannot be quench-hardened like steel because the crystalline structures are reversed . . . This is particularly true in titanium alloys with interstitial elements like carbon.

◆ Age hardening can be used on alloys of unstable beta phase but high temperature properties suffer . . . Alpha-beta type titanium alloys should be used in the fully stabilized condition.

By R. I. Jaffee
Supervisor
Nonferrous Physical Metallurgy Div.
Battelle Memorial Institute
Columbus, Ohio

◆ QUENCH-HARDENING heat treatments of the type used for steel are not applicable to titanium alloys. This is particularly true for alloys of titanium with interstitial elements like carbon, because the crystal structures of the allotropes of titanium are reversed. The alloys of titanium with the beta-stabilizing elements offer quench-hardening possibilities, but these are poor because retention of beta phase does not permit full hardening and causes trouble during tempering. Age hardening of unstable beta phase offers practical possibilities, but pitfalls, too, because of disproportionate embrittlement and the instability in service at elevated temperatures. In short, most alpha-beta-type titanium alloys are used in the fully stabilized condition for the reasons that follow.

The basis for the good heat-treating potential of iron is the fact that the high-temperature gamma phase is a close-packed structure, while the low-temperature alpha phase is not. The opposite is true for titanium, as is shown in Table I. The carbon atom is small, and in alloying enters the holes or interstices between the atoms of a solvent metal. This is why carbon is called an interstitial solute.

The close-packed structures, face-centered cubic or close-packed hexagonal, have larger interstices than those in the body-center-cubic structure. There is more empty space in the body-centered-cubic lattice, which is not close packed, but the available space is more wastefully arranged. In the close-packed lattice there are two kinds of interstices. The larger ones are between six atoms and are called octahedral interstices. The smaller are between four atoms, and are called tetrahedral interstices. Furthermore, in the close-packed lattice, the octahedral interstices are larger and the tetrahedral interstices are smaller than the interstices in the body-centered-cubic lattice.

The atomic radii of the titanium and iron atoms are roughly comparable, being 1.47° and 1.26 Å, respectively, in the close-packed structures. The carbon atom is much smaller, with a corresponding atomic radius of 0.77 Å. The carbon atoms fit very well in the large octahedral holes of the face-centered-cubic iron lattice. The maximum solubility of carbon in austenite is 2 pct or 8.7 atomic pct. The maximum solubility of carbon in hexagonal-alpha-titanium is smaller, about 0.5 pct or 2 atomic pct, which is still appreciable.

The smaller interstices available in the body-centered-cubic lattice, despite the larger amount of interstitial space, do not fit the car-

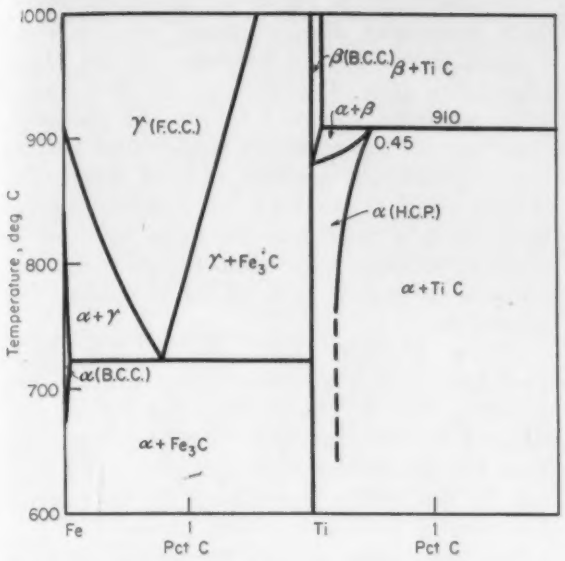


FIG. 1—The transformation ranges of the Fe-C and Ti-C systems[1] are different.

bon atom so well. Where the carbon atoms have a choice between entering the octahedral holes of a close-packed lattice and the tetrahedral holes of a body-centered-cubic lattice, more will enter the larger octahedral holes. This means that in a two-phase field, one phase being close-packed and the other nonclose-packed, the solubility of carbon will be greater in the close-packed phase.

This is the crux of the matter so far as carbon is concerned. Carbon has its greatest solubility in the low-temperature close-packed phase in titanium. In iron the greatest solubility is in the high-temperature close-packed phase. The two phase diagrams are shown in Fig. 1. The transformation range of iron is shifted toward lower temperature, because the close-packed phase is the high-temperature allotrope. Correspondingly, the transformation range with titanium is shifted upward because the close-packed phase is the low-temperature allotrope.

Consider now the strains set up when quenching is done from above the critical range. Both iron and titanium transform martensitically by shear when cooled rapidly through the transformation. For the pure metals, there are negligible strains set up during this process, and little or no hardening results. When carbon is present in iron, there is a different situation. Supersaturation of carbon occurs when austenite is quenched, resulting in the familiar very hard tetragonal martensite.

In the case of titanium-carbon alloys the converse occurs. These alloys are softened, as a result of quenching from above the critical, compared with their normal annealed hardness. The result is alpha martensite containing less carbon in solution than corresponds to the equilibrium amount in alpha. The hardness

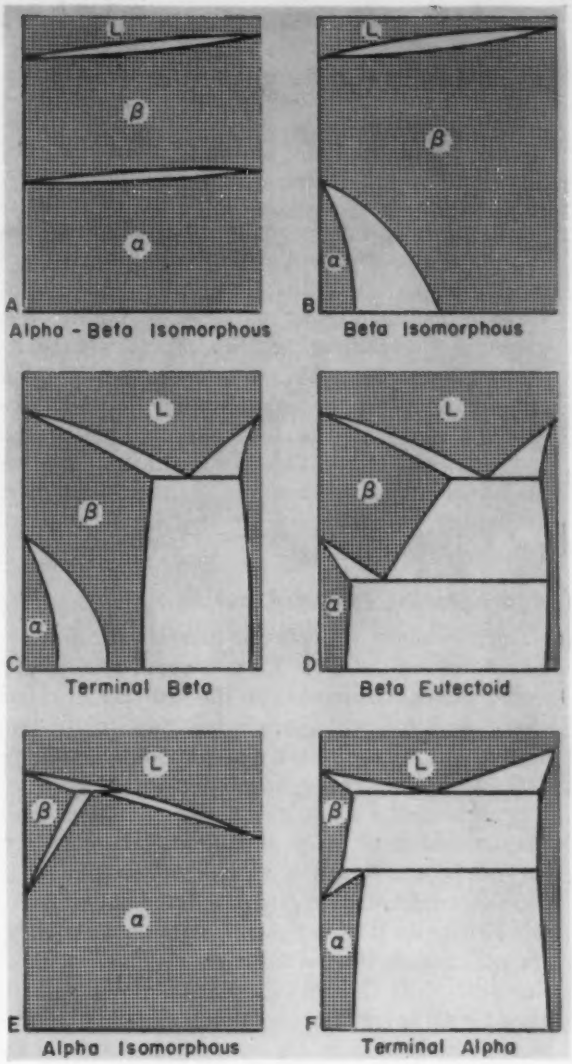


FIG. 2—The six basic types of titanium-rich solid-state equilibria show major characteristics.

and tensile data shown in Table II illustrate the softening of titanium-carbon which results from quenching from above the critical.

Tempered martensite in steel has excellent combinations of strength, toughness, and ductility. The structural changes undergone in the tempering process involve a decomposition of the martensite and retained austenite, producing a firm dispersed structure. During tempering of steel martensite, hardness decreases while ductility increases.

Tempering of titanium-carbon martensite

TABLE I

CRYSTAL FORMS DIFFER

	Iron	Titanium
Transition temperature	906°C	882°C
High-temperature allotrope	Face-centered-cubic (Gamma)	Body-centered-cubic (Beta)
Low-temperature allotrope	Body-centered-cubic (Alpha)	Close-packed-hexagonal (Alpha)

Beta stabilizing elements all have little solubility in the low-temperature phase.

produces quite a different reaction. None of the high-temperature beta phase remains as retained beta. All of the high-temperature beta transforms to alpha martensite during the quench. On tempering, the titanium-carbon-alpha martensite, which is undersaturated with carbon, does not decompose, but instead may dissolve some of the free carbide present in the quenched alloy. This results in an increase in hardness corresponding to solid-solution hardening of additional carbon in solid solution in alpha titanium.

Hydrogen fits the case, but . . .

The necessary criteria for martensitic quench hardening are, (1) a high-temperature phase richer in alloy content than the low-temperature phase and (2) an appreciable portion of the high-temperature phase transforming martensitically during the quench. To be the same as the carbon-steel case, the solute for beta titanium would have to be an interstitial solute but carbon is not suitable, as has been discussed. Oxygen and nitrogen, which have quite high solubilities in titanium won't help because they are alpha stabilizing-like carbon. The last two elements shift the transformation upward, and have lower solubilities in the high-temperature phase. Hydrogen is an interstitial solute that fits the case nicely but the trouble with hydrogen is that it requires about 0.25 pct before an appreciable amount of beta is formed, and notch toughness starts dropping at an alarming rate when as little as 0.005 pct H is present.

Too slow for ordinary heat treating

Turning to substitutional solutes, the so-called beta-stabilizing elements do fit the criteria for quench hardening. These are the elements which shift the transformation downward. The important beta-stabilizing elements in titanium are manganese, iron, chromium, molybdenum, and vanadium. All have high solubilities in the high-temperature phase and little or no solubility in the low-temperature phase.

The basic types of titanium phase diagrams are shown in Fig. 2. The beta-isomorphous type of diagram may be considered to fit all of the important beta-stabilizing elements. Actually, for the beta stabilizers mentioned, the beta-isomorphous diagram is correct only for molybdenum and vanadium. Iron, chromium, and manganese form beta-eutectoid systems, however, the kinetics of these eutectoid reaction are too slow for ordinary heat-treating practice.

Consider now a series of quenched alloys with increasing alloy content. As the alloy content increases, the hardness of the alpha martensite formed increases, in accordance with increased supersaturation. At the same time, the amount of softer retained beta is increasing and the amount of hard martensite is decreasing. These form two competing processes, with a maximum hardness attained at about or slightly lower than the alloy content required to retain beta phase completely on quenching.

Curves showing hardness in the beta-quenched condition versus alloy content are shown in Fig. 3. The peaks in the curves correspond to the maximum hardness resulting from the martensite transformation. The minima in the curves correspond to the lowest hardness in the retained-beta phase.

The magnitude of the hardening possible through quenching beta-stabilized titanium alloys may be found by comparing the as-quenched hardnesses with the hardnesses in the annealed or equilibrated condition. This is done for high-purity titanium-manganese alloys in Fig. 4A, which shows the hardenability as a shaded area. The corresponding quench hardenability for carbon steels is shown in Fig. 4B. The maximum hardenability in titanium-manganese is only 75 to 100 VHN whereas the maximum hardenability for carbon steel is about 500 VHN. For straight martensite transformation during the quench, and excluding the coherency effects resulting from slow quenches or mass effects, the hardening over the annealed state seldom exceeds 100 VHN for titanium alloys.

The slight hardenability of beta-stabilized titanium alloys is gained at the expense of a

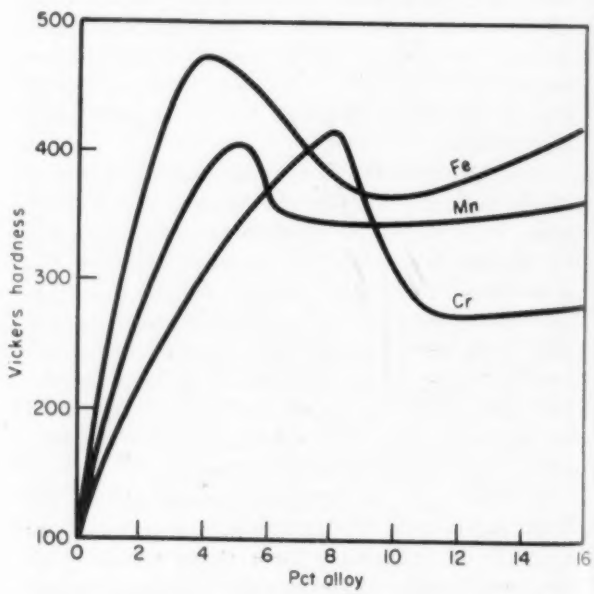


FIG. 3—Effect of water quenching from the beta field on alloys made with high-purity titanium. Data for Ti-Fe and Ti-Cr from[3], for Ti-Mn from[3].

disproportionate cost in ductility. In contrast, the all-retained beta alloys are almost as hard and strong as the hardest martensitically transformed alloys and their ductility is excellent.

H. W. Worner[5] has conducted experiments on commercially pure titanium-iron alloys which illustrate very well the behavior of beta-stabilized alloys during quench-and-temper heat treatments. Fig. 5 shows the as-beta-quenched and beta-annealed hardnesses as solid lines. The maximum hardenability of about 180 Vickers occurs at about 4 pct Fe. Maximum quenched hardness occurs at about 5 pct Fe. All-beta structures were formed with iron contents above 3.8 pct. This high hardness for the all-beta structures around 4.5 pct Fe most probably is the result of coherency or precipitation of alpha in the beta matrix. The much lower hardness of the annealed alloys is the result of large amounts of massive alpha, which is much softer than the beta phase.

Tempering the quenched alloys at the low temperatures, 220° to 440°C, has little effect on the hardness of the alloys with low iron contents up to 3 pct but results in large increases in the hardness of the high iron-content alloys. This result is caused by age hardening in the retained beta in these alloys. This has the effect of shifting the hardening curve to higher alloy contents, and also increase the magnitude of the hardness peak. It is very reminiscent of the type of quench-hardening curves obtained when slow quenches are employed or when massive pieces are treated. At the higher tempering temperatures of 650° and 750°C, the alpha precipitate becomes much coarser and the hardness curves approach the annealed hardnesses.

What is wrong with the hardening of beta-stabilized titanium alloys by quenching processes is too much retained beta. The retention of beta lowers the maximum hardening possible by martensite transformation. Also, it causes trouble in tempering by causing age hardening, with excessive brittleness resulting. The troubles associated with retained austenite in quenched steel are the same as those involved with retained beta in beta-quenched-hardened titanium alloys, but in the titanium alloys are magnified many times. In fact, there is no longer any practical consideration for beta-quench hardenability in the titanium alloys now in commercial production.

The aging propensities of the retained beta phase are such that age hardening is a possible, though little used, heat treatment for beta-stabilized alloys. One reason is that the strengths and hardnesses of all-beta alloys

TABLE II

QUENCHING SOFTENS TITANIUM

0.4 pct C alloy

	Annealed 850°C and quenched (Alpha)	Annealed 1000°C and quenched (Beta)
Vickers Hardness (10 kg)	275	196
Yield strength 0.2 pct offset	98,000 psi	59,000 psi
Ultimate tensile strength	93,300 psi	77,000 psi
Elongation, pct	38	27
Reduction in area, pct	48	43

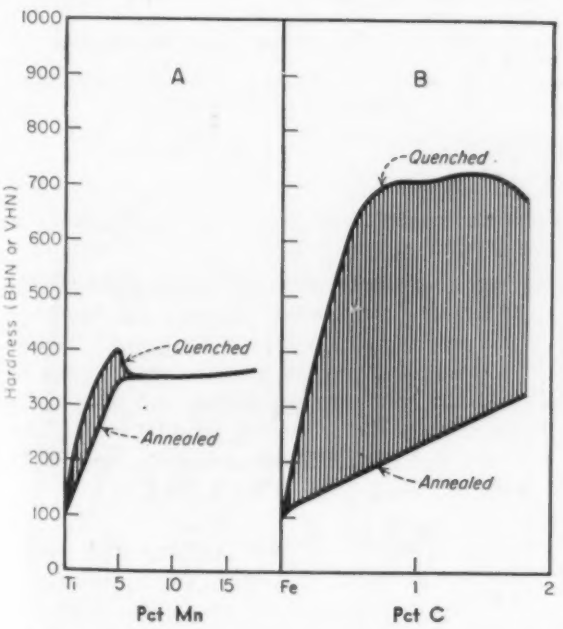


FIG. 4—The quench hardenability of Ti-Mn[3]. Compared to Fe-C[4] shows the large effect of carbon. Other interstitial elements also have a similar drastic effect.

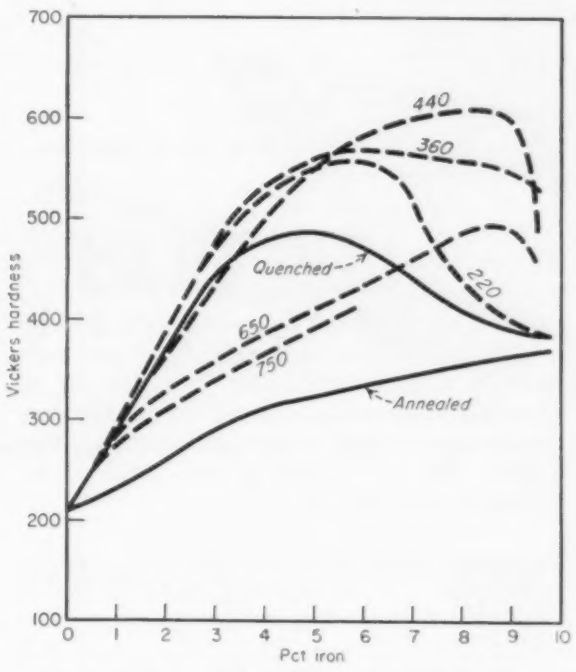


FIG. 5—Hardness of beta-quenched Ti-Fe alloys tempered for 20 min at 220, 360, 440, 650 and 750°C compared with as-quenched and as-annealed hardness[6].

Using balanced alpha-beta alloys can help bring about useful age hardening.

are quite high, and their ductility is excellent. Further hardening of the already high hardness level by age hardening causes a drastic drop in ductility. Representative hardening curves for titanium-iron alloys[5] are shown in Fig. 6.

A practical measure to effect useful age hardening is to use alpha-beta alloys in which the beta phase is unbalanced just the right amount. Aging hardening of the beta-phase component of the alpha-beta alloy can cause a useful amount of hardening without a disastrous loss of ductility. The retention of good ductility results from the presence of sizeable amounts of massive-ductile alpha phase, which is stable under the aging conditions.

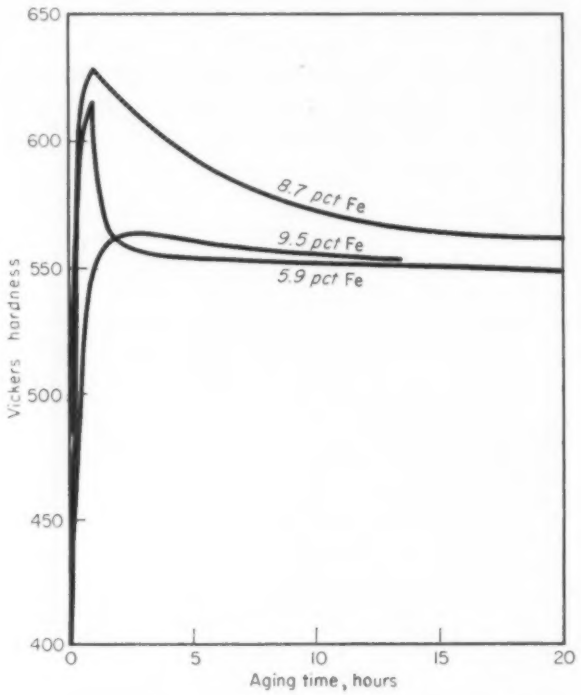


FIG. 6—Hardness of various Ti-Fe alloys quenched from 950°C and aged at 440°C[5].

Instability is just an uncomplimentary name for age hardening in beta-stabilized titanium alloys. It is called "instability" by persons concerned with aircraft applications, which are mostly in the temperature range of 200° to 450°C. When a titanium alloy becomes hard and brittle during service in this temperature range as a result of aging of the beta phase, the alloy is said to be unstable. Stabilizing heat treatments minimize this tendency by transforming as much of the unstable-beta phase to massive alpha as possible. This is done, for example, by heating the alloy to an intermediate temperature in the alpha-beta field, 600° to 700°C and holding sufficiently long to transform the beta phase to massive alpha. Or frequently, the alloy is slow cooled from about 700° to about 600°C which is approximately the lowest temperature at which the beta phase can transform to massive alpha. These heat treatments also place the alpha-beta alloys in their softest condition.

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[4] H. Esser and W. Ellender: Archiv. fur d. Eisenhüttenwesen, 4, 1930, p. 113.

[5] H. W. Worner: "Heat Treatment of Titanium-Rich Titanium-Iron Alloys." Journal Inst. Met., 80, 1951-52, p. 213.

NEW FILMS

"New Weapon Against Corrosion," tells the story of lead-clad steel and copper. Shows techniques used in fabricating the metal, and describes its importance in the fight against corrosion. In color, 16 mm, with sound. Free loan. Knapp Mills, Inc., 23-15 Borden Ave., Long Island City, N. Y.

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Technical Briefs

TESTING:

Jet engine speeds at 1500 mph on special railroad track.

A rocket engine that streaks on rails over the world's fastest earthbound test laboratory at more than 1500 mph has been designed and built by North American Aviation for the Air Force.

The test sled was produced by the Cook Research Laboratories Div. of Cook Electric Co., Chicago, for the Air Force Wright Air Development Center's high speed tests of aircraft and missile equipment.

Runs On Rails

Using an oxygen-alcohol fuel to generate 50,000 lb of thrust, the rocket engine can accelerate the sled from a dead stop to over 1500 mph in 4.5 sec while traveling 5500 ft.

Although much smoother, track for the sled is similar in type and size to standard railroad track. About 10,000 ft of track is laid for sled tests at Edwards Air Force Base, Calif.

High on the priority list for work with the sled are tests performed by the Cook Research Laboratories to determine the best design and construction of parachutes to be used with supersonic jet airplanes.

Parachutes

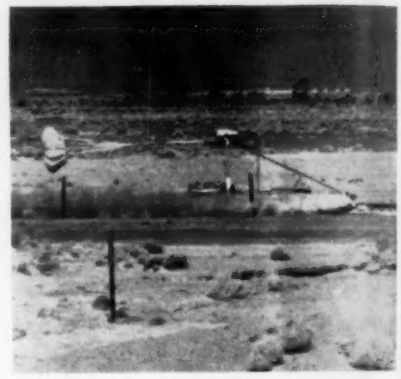
Parachutes which operate satisfactorily when released during the high speed tests are certain to give good service when "bailed out" of jet airplanes at about half the speed of the sled.

Instruments and materials can also be checked for high speed service. With special adaptations, the sled can be used to determine the effects of high speeds and fast stops on human beings.

JET AGE EQUIPMENT gets a 1500 mph ground test with this unusual sled on rails developed by North American Aviation, Inc., for the Air Force.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 121. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.



FOUR AND A HALF seconds after starting, this rocket engine on rails streaks at 1500 mph across the desert. Scoop drops from rocket sled into water trough between tracks to brake speeding projectile.

The sled's versatile propulsion system is readily adaptable to assist airplane take-offs from runways or carriers. The liquid fuel rocket engine has a distinct advantage over solid fuel types in its ability to operate over much wider temperature ranges in all kinds of weather.

Fuel Costs Lower

A test run using the liquid fuel power plant costs about $100 compared with the $5000 cost for a similar test with a solid propellant unit. The rocket engine will run up to 8 seconds with one fueling and refueling is almost as simple as "gassing up" an automobile.

Riding on super-hard metal runners which slide almost frictionless over perfectly parallel rails the sled weighs about 4000 lb, is 22 ft long, 9 ft high and 5 ft. wide

CONTINUOUS CASTING:

Wider range of bar, tube shapes available . . . Market grows.

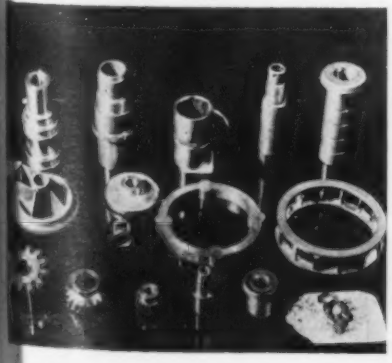
Back in 1948, when American Smelting & Refining Co. marketing men decided their continuously cast alloys were ready for warehouse distribution they drew up an estimate of the entire potential market, then aimed at part of it. The commercial process was then less than a year old so the job was difficult, but they finally came up with what they thought a reasonable figure for copper-base alloy rods and tubes.

Two things have happened since then to knock that estimate into a cocked hat. One was Korea. The other came from the company's own engineers, who developed a wider range of sizes and shapes. As a result, Asarco's sales of continuously cast copper-base alloys now exceed its 1948 estimate of the entire U. S. market potential.

Efficiency Up

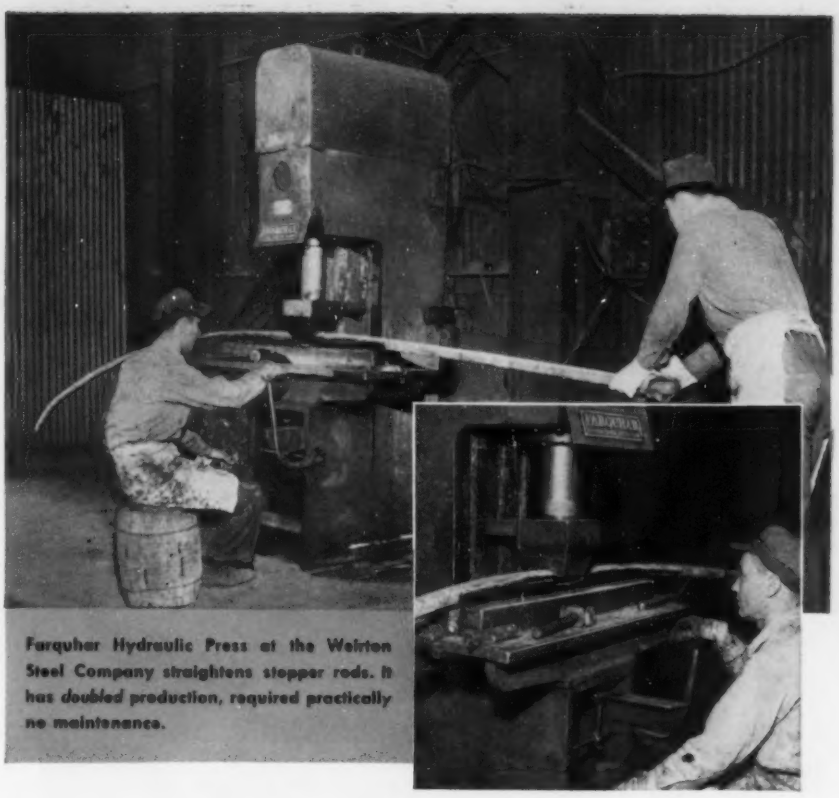
The plant at Barber, N. J., originally described in THE IRON AGE (Aug. 26, 1948) has not been materially changed since it started commercial production in 1947. But experience has increased its efficiency (total downtime last month was 10 pct) and widened the range of sizes made. Limits are now 7/16 to 5⅛-in. diam for rods, tubes and shapes. Maximum length is 20 ft.

About 20 pct of the plant's pro-



RANGE OF SHAPES and sizes of tube and rod products available from Asarco continuous casting machines is rapidly expanding. Above are some parts made from continuous-cast stock.

Turn Page



Farquhar Hydraulic Press at the Weirton Steel Company straightens stopper rods. It has *doubled* production, required practically no maintenance.

Farquhar Hydraulic Press

at the Weirton Steel Co.

"eliminates breakage of rods . . . increases production 100%"

The Weirton Steel Co., Weirton, W. Va., formerly straightened stopper rods with a steam hammer. The operation was slow and resulted in a high percentage of breakage. Seeking a better method, Weirton officials bought a Farquhar Press to speed production. Not only has the press increased production 100%, but it has eliminated breakage of rods. In addition, Weirton reports that in the six years this press has been operating, "practically no maintenance has been necessary."

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duction goes to warehouses in 83-7-7-3 bronze only; brass mills buy about 45 pct; and the balance is sold directly to makers of aircraft engines, air brakes, refrigerators, etc., in various analyses.

The Asarco process differs from other commercial continuous casting techniques in that it produces copper-base alloy stock ready for machining or other fabricating operations. Up to 1200 lb of molten metal supplied by a Detroit arc furnace are held in a graphite crucible. From there it is valved to a graphite die, the lower part of which is surrounded by a water jacket to freeze the metal as it descends through the die.

Graphite Dies

Rollers pick up the rod, tube or shape as it moves down vertically from the die. A horizontal saw cuts the stock to length and the cut pieces are tilted to the horizontal on the ground floor.

The graphite dies can be machined to cast unusual shapes (webs inside tubes or 5 tubes at once) and buff to a nice finish. They cost $40 to $50 each.

MANAGEMENT:

Executives need more research data in making decisions.

Management as well as engineers in industry need more scientific assistance in making today's management decisions and planning long term company policy, according to Dr. J. E. Hobson, director of Stanford Research Institute.

Mounting barriers of widespread operations, human relations within the corporate complex, government regulations and defense requirements make management's task increasingly difficult.

Operations research, a method of integrating scientific techniques into a single research approach may be one answer to effective managerial operations, Dr. Hobson suggests.

Technical, economic and human factors influence current operations and future plans and must be considered in establishing effective company policy.

CORROSION:

Engineers at Chicago NACA meeting tackle corrosion problems.

Corrosion engineers from all over the country, more than 1400 of them, turned up in Chicago recently for the Ninth Annual Conference of the National Association of Corrosion Engineers. Their task: How to whittle down the enormous toll corrosion exacts of industry.

Strong interest was shown in thermal plastic and reinforced plastic pipe and tubing for the oil industry. Last year's output of this still infant industry was estimated at 1 million lb of thermal plastic pipe, largely in the 2 to 4-in. diam.

Pipe Production Rising

A large producer of glass-reinforced plastic pipe figures his output at 250,000 ft in 1952, and twice that for 1953.

Machinery was set up to study the use of thermal plastic and glass-reinforced plastic pipe in the oil industry. A questionnaire will be circulated to annotate results of testing the completed pipe under field conditions.

A second study will evaluate field installations, the application being made, and results obtained. Besides reducing external corrosion, it is believed plastic pipe may reduced internal scale and parafinning.

Steel to plastic connections have been a source of some difficulty due to the variance in expansion coefficients, and use of plastic pipe in areas where high pressures may occasionally be found, as near well heads, has been a drawback.

What About Corrosion?

Every year corrosion exacts a larger toll from industry. Spearheading the fight against corrosion is the National Assn. of Corrosion Engineers. Recently they met in Chicago for their Ninth Annual Conference. On the following pages are several brief reports on papers delivered at the Chicago meeting.

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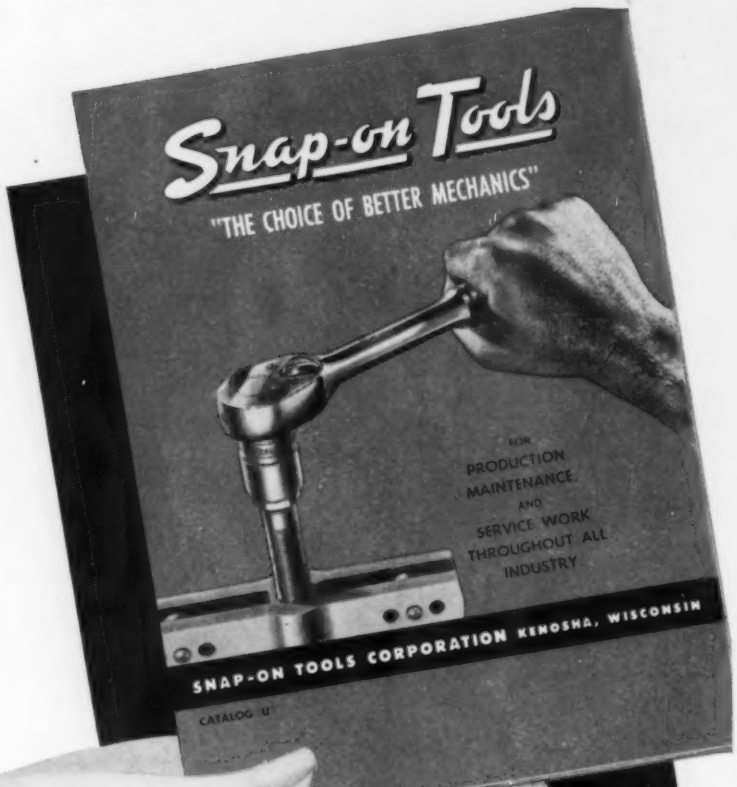
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—Technical Briefs—

RESEARCH:

High temperature lead corrosion of stressed steel studied.

Sudden failure of wrought steel lead kettles used in the temperature range of 1000° to 1200° F were studied in a recent laboratory investigation reported by H. F. Peters of Lukens Steel Co., Coatesville, Pa. The paper was presented at the recent Chicago meeting of the National Association of Corrosion Engineers at Chicago.

Failure occured in a form of intergranular cracking originating on the interior surfaces of the kettles. The effect of variations in lead bath composition, stress, temperature and microstructure on corrosion and stressrupture life of rimmed and silicon-killed steel specimens was investigated, and the possibility of a stress-corrosion mechanism explored.

ALLOY STEELS:

Effect of boron and cobalt on oxidation resistance above 1650° F.

Boron or cobalt in steel have an adverse effect on oxidation resistance, at temperatures over 1650°F, W. O. Binder and E. D. Weisert of Electro Metallurgical Co. and Haynes Stellite Div., Union Carbide and Carbon Corp. reported.

Chromium and nickel had a beneficial effect. Molybdenum strongly decreased the alloy's oxidation resistance. Solution suggested was that boron alloys may be designed with no-boron oxidation resistance by keeping the iron content below 6 pct and the use of tungsten rather than molybdenum as a minor addition for strengthening purposes.

Central Station Pumps

Speaking on central station pumps, J. B. Godshall of Ingersoll-Rand, indicated that increased temperature, pressure, and purity of central-station feedwater caused corrosion and erosion in feed pumps.

Solutions may lie in use of 5 pct chromium steels, but higher alloy

Turn to Page 175

concentrations do not provide a marked improvement. Cast iron and carbon steel are not generally suitable. Heater drip pumps need all-bronze or 13 pct chromium steel construction if dissolved gases are present.

If there is not contamination, or if temperatures are low, iron or steel casings with bronze impellers are good. For sea and harbor water circulating pumps, all-bronze construction is desirable. In areas of strong pollution, stainless steel impellers in bronze castings are sometimes necessary. Monel or stainless shafts are the best bet for preventing corrosion fatigue.

B. B. Reinitz, Okonite Callender Cable Co., Inc., Paterson, N. J., discussed corrosion of lead cable sheaths.

PIPE CORROSION:

Scale formation in building pipes studied.

Corrosion and scale formation in internal pipes may be accelerated by hot water circulation, H. L. Shuldener, Water Service Labs, Inc., New York, reported in a discussion of operating conditions and pipe corrosion in buildings.

Improper circulation can mean fluctuating water temperatures with resultant accelerated corrosion or excessive expansion and contraction strains at water joints. Aquastats and mixing valves are not always understood properly by building superintendents. Improper water heating and distribution are the result.

Hydrogen Penetration

With considerable interest being shown in oil industry corrosion problems, two papers attacked directly the problem of hydrogen penetration of steel in refinery equipment. T. Skei and A. Wachter, Shell Development Co., Emeryville, Calif., concentrated on hydrogen penetration; E. H. Tandy, Standard Oil Co., of California, discussed inspection of refinery equipment.

Hydrogen sulfide solutions in

Turn Page

The right handling equipment for the job. Stacks of sheets are moved away from shears and accumulate on this Roller Conveyor line, then removed to storage by crane at crane operator's convenience. No shear delays, no crane delays.

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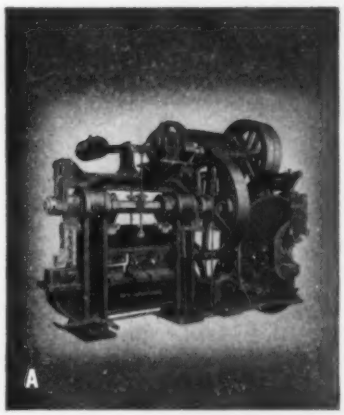
You don't consult the occult when buying new equipment for industry. We're not fortune-tellers but we'll predict a bright future for any plant where BEATTY machines are added to the production lines. If one of the machines shown doesn't answer your particular needs, we'll design and build one that will. Call a BEATTY engineer for experienced help whenever production problems are considered.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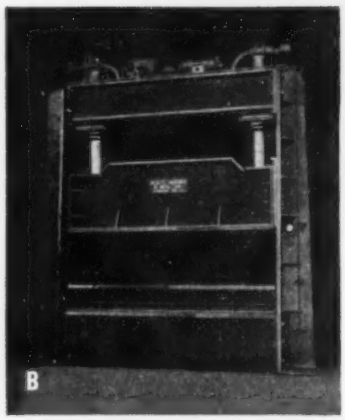
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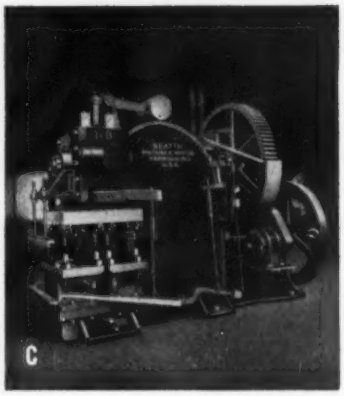
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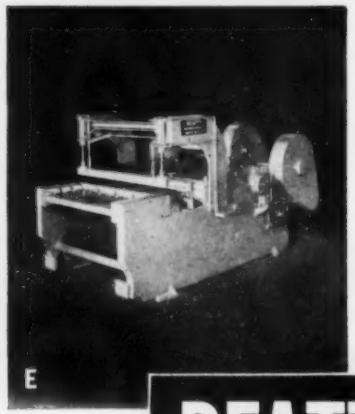
E

BEATTY
MACHINE & MFG. CO.
HAMMOND • INDIANA

A. BEATTY Co-Pun-Shear, one unit that does coping, punching and shearing without changing tools.

B. BEATTY Vertical Hydraulic Bulldozer for hot and cold pressing and forming of heavy metal.

C. BEATTY Heavy Duty Punch that handles steel up to 65 ft. long. Punches webs, and flanges.

D. BEATTY Press Brake and Flanger handles any type of bending, forming, flanging, pressing.

E. BEATTY Horizontal Multiple Punch for line punching of vertical flanges.

corroding steel produce hydrogen which penetrates the steel appearing as hydrogen blisters, along with fissuring and embrittlement of the steel.

Change the Environment

In some hydrogen sulfide environments, a scale of iron sulfide will form over the metal and practically kill the reaction. But in alkaline solutions containing cyanide ions, the hydrogen penetration, continued as a ferrocyanide complex, prohibited scale formation.

Only positive solution is a change in chemical environment. But while hydrogen sulfide corrosion can be safely predicted, the refinery inspector must watch carefully for overheating, which will accelerate corrosion.

Corrosion In Gas Tanks

Naphthenic acids are very corrosive at their condensation points. Similarly, corrosion in gasoline storage tanks is accelerated by the presence of other gases, even though at a slower rate than in the distillation equipment.

In the same vein, Jack L. Battle, Humble Oil and Refining Co., Houston, Tex., in his paper "Corrosion of Casing Oil and Gas Wells," points out that a report based on only 10 pct of the active wells, indicated that this group alone payed $2 million annually for corrosion repairs.

Vanadium and Oxidation

F. C. Monkman and N. J. Grant covered accelerated oxidation due to vanadium. With an increase anticipated in the use of vanadium bearing crude fuel oils in high temperature installations, data is needed on the accelerated oxidation caused by oxides of vanadium and molybdenum.

Chemical analysis and X-ray diffraction on oxide scale formed on 347 stainless in contact with liquid V_2O_5 indicated highest oxidation levels and vanadium concentrations at the metal-oxide interface. There was also evidence of a vanadium-oxygen-metal compound.

FUNDAMENTALS:

Electron exchange at root of corrosion problems.

Fundamental concepts of electrode potentials, and the relation of electron exchange to corrosion problems, were presented by Andre J. deBethune of Boston College, Mass.

Potential differences observed at metal-liquid interfaces arise from phenomena associated with Faraday's Law in the case of reversible electrodes; and phenomena associated with the charging of the double layer in the case of polarized electrodes.

HOT EXTRUSION:

Electronic controls regulate hot extrusion temperatures.

A series of radiation devices which "see" the heat, are the heart of a complex electronic control system which automatically regulates critical temperatures in a new hot steel extrusion process recently unveiled by U. S. Steel's National Tube Div. in Gary, Ind.

Developed by Minneapolis-Honeywell's Industrial Div. engineers and U. S. Steel technicians, the detecting is comparable to an electric eye. The heat, or temperatures in the heating furnaces and salt baths are picked up by a lens in the "radiamatic pyrometer" and focused on a highly sensitive assembly of thermocouples connected to the measuring instrument.

Slugs First Preheated

The tough stainless steel slugs are first preheated in a three-zone gas-fired furnace. This furnace can produce temperatures up to 2300° F. The slug is then carried by conveyer to a salt bath which softens furnace scale and brings the steel up to final extruding temperature—usually about 2200° F.—to make it plastic. The slug is then rammed through dies by a 2500-ton hydraulic press—much the way toothpaste is "squeezed" from a tube—into a variety of tubular and complex shapes.

Turn Page

You Can Judge a Machine by the Calibre of its Users!

In every section of the country...in every branch of industry . . . you will find satisfied owners and operators of UNIT equipment. Surely, such widespread popularity must be deserved. Why not investigate? Write for novel "TV" brochure that depicts the complete Unit line.

These Prominent Firms Use UNIT Cranes and Shovels

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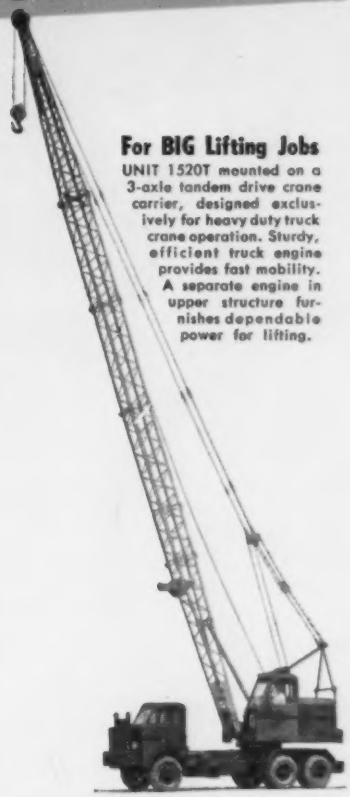
Chrysler Corporation
Consolidated Vultee Aircraft
Diamond Match Company
Dow Chemical Company
Frigidaire
General Electric Company
General Motors (Pontiac Div.)
Goodyear Tire & Rubber Co.
Great Lakes Steel Corp.
International Harvester
Niagara-Mohawk Power & Light
North Carolina Pulp & Paper
Northern Natural Gas Co.
Oliver J. Olsen Shipbuilding
Packard Motor Car Company
Pennsylvania Railroad
Pittsburgh Plate Glass Co.
R. J. Reynolds Tobacco Co.
Sacony Vacuum Oil Company
Shell Oil Company
A. O. Smith Corporation
Universal Pictures, Inc.
Weyerhauser Timber Co.



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UNIT 357 Self-propelled Mobile Crane with Magnet Lifting Scrap Iron.

Available in Crawler and Mobile Models . . . ½ and ¾ Yard Excavators . . . Cranes up to 20 tons . . . Cranes up to 20 tons lifting capacities . . . Fully Convertible to all attachments.

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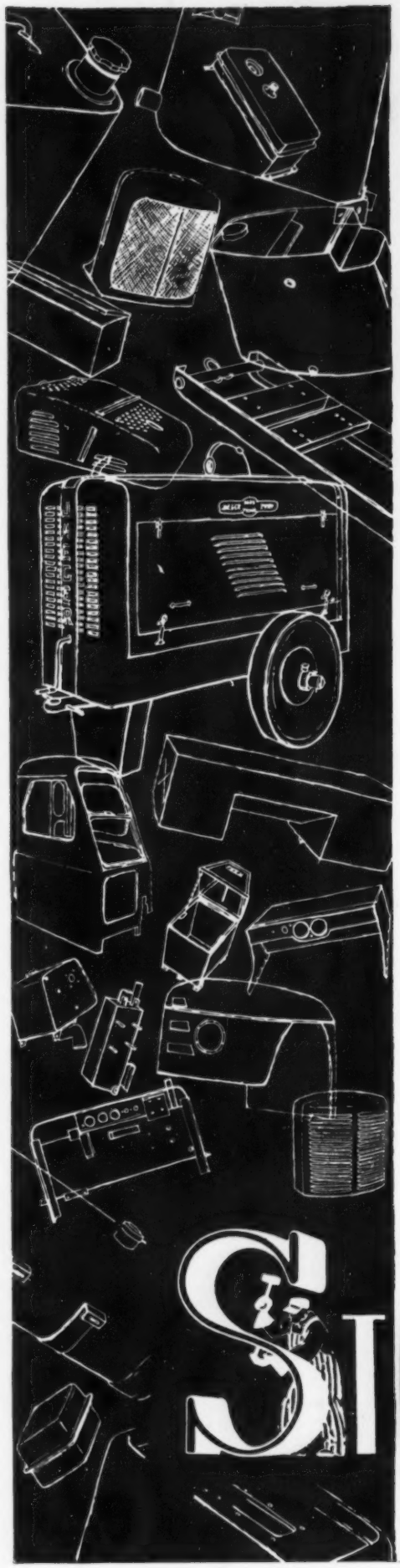

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(MILWAUKEE DISTRICT)

—Technical Briefs—

TELEVISION:

Tiny Alnico magnet built into TV "electron gun" tube.

Permanent magnets are being built into new television picture tubes to eliminate external focusing controls and to cut production costs by discarding three assembly units.

In a new General Electric TV tube displayed at the 1953 meeting of the Institute of Radio Engineers in New York, the external ion trap, focusing unit, and mechanical support have been replaced by a simplified ion trap and focusing unit, both built within the tube. Key to this new design is the tiny but powerful Carboloy permanent magnets encased within the tube.

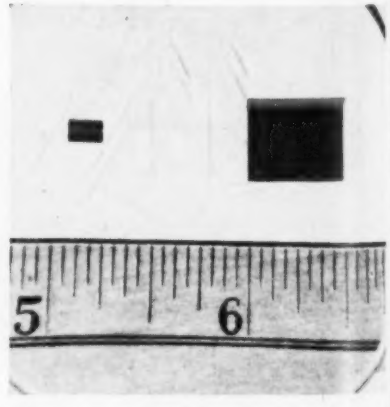
Magnet Size Reduced

Size of the Carboloy Alnico 5 magnet used in the ion trap has been reduced to one tenth that of the magnet previously employed. The new magnet is ⅛ in. in diam and ⅛ in. in length. The former magnet was rectangular, approximately ½ in. in length, ¼ in. thick and ⅜ in. wide.

Major Design Change

The internal focusing device employs three Carboloy permanent magnets, measuring only ¼ in. in diameter and ⅝ in. long.

Optimum clarity of focus is achieved through factory-fixed focusing which eliminates the necessity for any external focusing control requiring adjustment by the set user.



ALNICO MAGNETS used in ion trap of new GE television tube replace magnet ten times larger.

TITANIUM:

Corrosion of titanium and other alloys studied.

The effects of galvanic corrosion were demonstrated in a recent study of titanium coupled to other metals. Tests were described by W. Lee Williams of the U. S. Naval Engineering Experiment Station, Annapolis, Md., at a recent meeting of the Society of Automotive Engineers at Detroit.

Tests were carried out with various materials in the form of panels, each with an exposed area of 10 sq in. The panels were immersed, both individually and coupled to titanium, in natural sea water flowing at a velocity of 2 to 4 fps. Weight losses suffered by these panels were measured after 145 days of exposure.

In all cases the weight changes of the titanium panels were so low as to be hardly detectable. Data of most interest are the corrosion rate acceleration factors resulting from coupling various materials to the titanium.

Tested With Monel

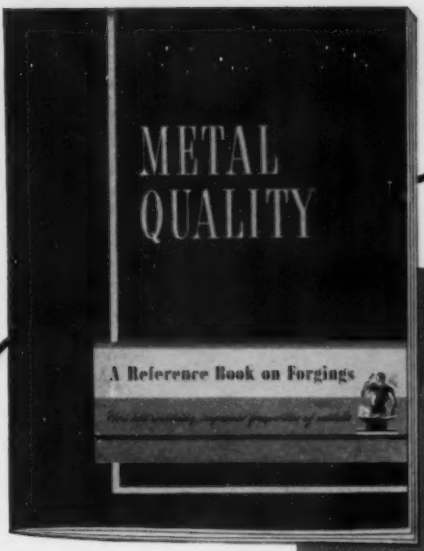
With the exception of Monel, all metals which suffered accelerated corrosion were those which occupy positions to the anodic side of titanium in the galvanic series. Although Monel is to the cathodic side, its potential in sea water is very close to that of titanium.

The very small acceleration factor might be attributed to the normal variations common to corrosion tests rather than to any real galvanic accelerating effect. The corrosion rate of the passive stainless type 304 alloy was retarded by the couple, as would be anticipated from its position in the galvanic series.

Aluminum Alloy

In another sea water test not involving titanium, an experimental aluminum alloy condenser fitted with an aluminum alloy water box was studied. The aluminum water box was connected through an insulated flange to a 70-30 copper-nickel piping system. The flange joint was opened for a periodic inspection of the con-

Turn Page



Engineering, production and economic advantages obtainable with forgings are presented in this Reference Book on forgings. Write for a copy.

FORGINGS ARE UNUSUALLY EFFECTIVE FOR SOLVING PROBLEM PART PROBLEMS

A problem part problem, however complex, often ceases to be a problem once all the aspects of the part are checked with the unrivaled economic and mechanical advantages of closed die forgings and the closed die forging process for producing parts. Whatever the nature of problems that make a problem part, consult a forging engineer to determine the extent to which forgings can help you solve them.

DROP FORGING ASSOCIATION
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Please send 60-page booklet entitled "Metal Quality—How Hot Working Improves Properties of Metal", 1949 Edition.

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Photo at ALAN-BARR ALUMINUM CO., INC., Palmyra, Pa.

cuts handling costs 20%
with Brainard Strapping Service

BEFORE salesman Bob Stuart of Harrisburg put *Brainard service* to work, these aluminum ingots were stored and shipped loose.

Then Bob, working with his customer's materials-handling engineer, helped develop a more efficient method. The ingots are now emptied directly from the furnace into special cradles on a conveyor belt. The cradles are designed so that unit loads, of 28 ingots each, can be strapped with Brainard heavy-duty strapping while still on the conveyor line. Then the unit loads are palletized and strapped, ready for fast handling by lift trucks.

Bob's ideas and experience paid off—labor costs are down 20%, less storage space is required, and customers are pleased with the palletized loads.

Ask your Brainard salesman *now* for recommendations — Brainard service can lower costs and boost efficiency in your materials-handling and shipping operations. Brainard offices located throughout the U. S. In Canada: Brainard Steel Canadian Division, Toronto.

COMPLETE STEEL STRAPPING SERVICE, LIGHT AND HEAVY-DUTY STRAPPING, TOOLS AND ACCESSORIES

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SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

Write for illustrated catalog. Brainard Steel Division, Sharon Steel Corp., Dept. O-4, Griswold Street, Warren, Ohio.

STEEL STRAPPING

—Technical Briefs—

Continued from Page 179

denser, but the operator forgot to replace the insulation during reassembly. After three additional months of operation, the aluminum pipe was corroded through completely at the joint.

Bronze globe valves, fitted with Monel seats and disks, are used by the Navy for throttling service in salt water lines. However, at high water velocities the turbulence from the design and throttling action causes severe erosion damage to the Monel seats.

Titanium was tried as a seat material because its sea water corrosion and erosion resistance are outstanding, and because it occupies a position very close to Monel in the galvanic series. The valve was fitted with a titanium seat and then used for 16 months at a nominal pipe water velocity of 15 fps.

Bronze Corroded Out

The titanium seat came through with flying colors. Unfortunately, galvanic corrosion of the bronze was greater with titanium than with Monel. At the end of the test period, the bronze body seat threads were corroded to such an extent that the seat dropped out. The obvious solution was to use a water insoluble thread compound to keep the water out of the local danger area.

The last metal studied was a 70-30 copper-nickel alloy tube sheet on an experimental condenser. The part was in test for months in sea water. Titanium tubes were installed in this condenser.

Titanium Stands Up

The cupro-nickel tube sheet suffered galvanic corrosion to the extent of 0.006 to 0.010 in. overall metal loss, with pits developing to depths up to 0.030 in. in the immediate vicinity of the tubes.

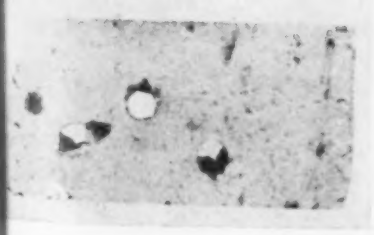
Although failure was still remote, the experiment demonstrated that the attack of the cupro-nickel was excessive. Hence, titanium tube sheets would be more desirable despite higher initial costs.

STONE CUTTER:

Self-energizing arc rod slices through concrete, stone.

A new process for cutting and piercing stone, cement, concrete and refractory materials was demonstrated recently by the Chemo-

STONE AND CONCRETE can be cut with Dynarc cutter developed by Chemotec Div. of Eutectic Welding Alloys Corp.



ARC RESEMBLES a flame and can operate independently in midair. The self-energizing arc rod can cut concrete, above, and slice through fire brick, bottom. Rod requires no ground, works off 400 amp dc welder.

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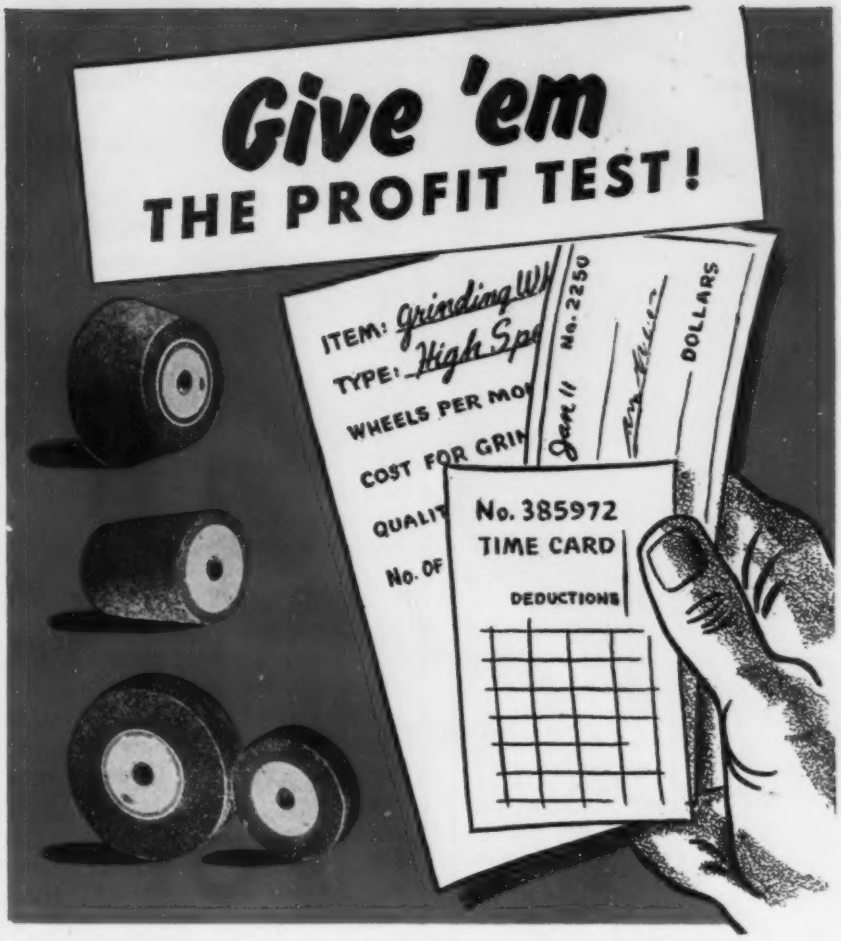

Electro Specific Purpose Grinding Wheels

Every man-hour you save and every tool cost you cut, add to profits; that is, when gains in quality accompany these gains in economy. Whether you use standard speed vitrified, or high speed resinoid wheels, we'll stand or fall on our bid for your business if you will give Electro Specific Purpose Grinding Wheels the *profit test* rather than the *cost test.* Write, wire or phone and, wholly upon our responsibility, we'll send a technical expert to help you do it in regular production.

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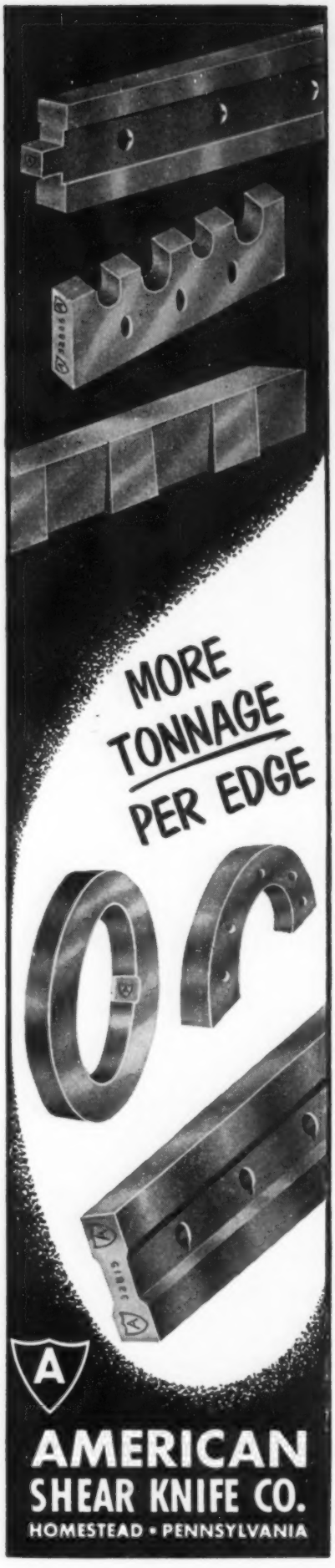

Tec Div. of Eutectic Welding Alloys Corp., Flushing, N. Y.

An arc rod was used on non-conductive material, without a ground connection, to pierce rock. Liquid stone poured out of the hole.

The DynaTrode creates its own arc. It requires no ground and does not have to be struck upon metal. The operator has complete control at all times and determines when and where the arc will start. The arc operates in mid-air as well as it will upon stone and resembles a flame in appearance. It has all the characteristics of a super torch flame from 5 to 8 in. in length.

Conventional dc Welder

A self-energizing arc rod is used. The heavy coating, formulated to give the thermo chemical interreaction with the arc stream needed to react with the non-metallic material, is reduced more slowly than the core.

No compressors, air lines, oxygen tanks, pneumatic drills are necessary. A conventional direct current welding machine with a capacity of 400 amps or more is needed.

MILL CONTROLS:

X-ray gage controls reduce variations in rolled strip.

In conventional rolling of copper alloy, strip thickness is spot-checked with a hand micrometer. Rolls are set by rule-of-thumb methods based on the operator's experience. These methods, still practiced in many rolling operations, are crude compared with the degree of control that can be obtained with modern electronic gaging and control.

Variations in strip thickness as it emerges from the rolls generally are due to dimensional variations introduced by previous rolling operations, and hardness variations.

Little Maintenance

Disadvantages of mechanical gaging with micrometers and mechanical control may be overcome through use of an electronic instrument such as a carefully selected X-ray gage.

The X-ray gage used by Chase

STEEL PLATE WORK

TURBINE CASINGS and other heavy steel plate work are fabricated at Puseyjones of Hot-Rolled, High-Strength, Low-Alloy Steel.

Every facility for large scale metal fabricating: — Heavy plate shop equipment — Rolls — Shears — Bending furnaces. Stress relieving furnace 33'x18'x16' up to 2100°F. Machine shop for facing, turning, and boring. 50 ton capacity gray iron foundry. Deep-water transportation on one side, the Pennsylvania RR on the other. Talk to our development engineers.

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THE PUSEY AND JONES CORP.
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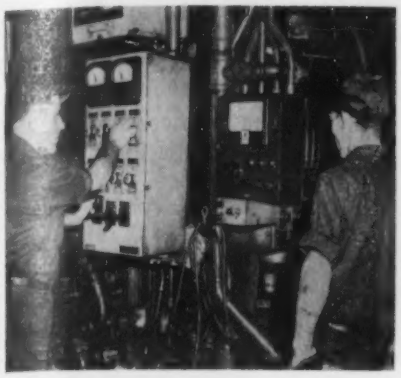


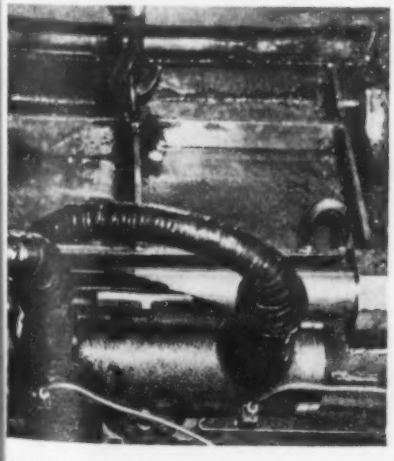
AUTOMATIC CONTROL of copper alloy strip thickness is obtained by means of X-ray gages in mills of Chase Brass & Copper Co.

Brass & Copper Co., Waterbury, Conn., in its rolling mills were made by Industrial Gauges Corp., Englewood, N. J.

First X-ray gages were installed several years ago in a Chase Mill in Cleveland and are still in use. Since that time Chase has installed a total of seven of these X-ray gages. Very little maintenance work has been required to keep them in continuous use. There have been no X-ray tube burnouts. Occasionally maintenance crews have replaced an electron tube.

X-ray Unit Shielded

The gages, operating on 155 v a-c lines, contain a compact high voltage source and X-ray tube, both shielded for safety. The source unit is placed about 8 in



SHIELDED X-RAY source for automatic gaging of copper alloy strip is about 8 in. beneath the strip as it passes through the mill rolls.

Turn Page

DELTA MILWAUKEE QUALITY MAKES THE DIFFERENCE

NOW! 3 Models of

DELTA Drill Units

AIR POWERED–HYDRAULIC CONTROL

A practical, low-cost way to solve machining problems involving drilling, tapping, reaming, spot facing, hollow milling, chamfering, centering, counter-sinking and the like—Use the Delta Drill Unit to devise special tool set-ups that multiply production, break bottle-necks.

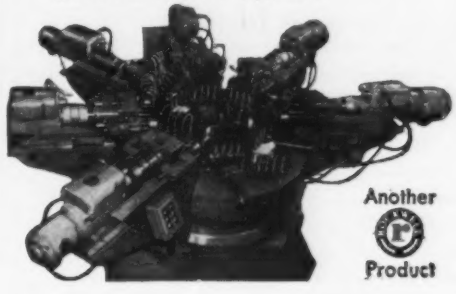
Rarely has a new machine achieved success so completely and so quickly as this new Delta air-powered hydraulically controlled Drill Unit.

Thousands of manufacturers, on the alert for ways to get better production faster and at least cost, have won astonishing benefits by means of this adaptable unit—by designing special machines for multiple and series operations.

You'll appreciate "Why" when you check these 12 reasons:

1. Quick set-up. No cams used.
2. Rapid approach and return.
3. Length of approach and total stroke positively controlled.
4. Approach repeats to within .010 inch—final depth to within .0005 inch.
5. Power feed hydraulically controlled . . . independent of motor and spindle speed.
6. Compressed air provides the force on a sealed, pumpless hydraulic system to move spindle forward, completely eliminating lost motion and back lash.
7. Sealed unit construction permits operation in any position.
8. Built-in control switches.
9. Units offered as direct drive, gear drive, or pulley drive.
10. Standard NEMA frame motors.
11. Utter simplicity of operating principle and rugged design insure long, trouble-free service.
12. Operates efficiently at standard plant 80 p.s.i. air pressures.

Eight station, semi-automatic drilling machine built for Badger Meter Mfg. Co. of Milwaukee. This machine drills, counter-sinks and counterbores over 230 parts per hour. Machine has six working stations, a total of 22 spindles producing 5,000 individual operations per hour.



Another Product

Three models are now available to meet your specific requirements:

MODEL 19-150—1½" stroke. Capacity from No. 80 to 5/16" drill. 4 types of drives.

MODEL 19-400—4" stroke. Approximate capacity up to 5/8" drill. 5 types of drives.

MODEL 19-600—6" stroke. Approximate capacity 1" drill. 6 types of drives.

See your authorized Delta drill unit dealer —write for the new catalog.

DELTA POWER TOOL DIVISION
ROCKWELL MANUFACTURING COMPANY
6420 N. Lexington Ave., Pittsburgh 8, Pa.

☐ Please send me catalog AD-723.
☐ Send name of nearest authorized Delta drill unit dealer.

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Position_____
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beneath the strip at a point within 2 ft of the rolls.

A small hole in the top allows a tiny X-ray beam to pass upward through the moving strip. When the mill is not operating this aperture is automatically blocked with a shield-guard.

After the X-ray beam has passed through the strip, with some of its energy absorbed by the metal, it passes into a small pickup device that is mounted over the strip directly above the aperture in the source unit.

The pickup unit converts the X-ray energy into electrical energy which is amplified and fed into a zero-center meter calibrated to indicate deviation from nominal gage.

Maximum readings indicate a variation of plus or minus one tenth of the strip thickness. The scale is graduated so that readings as little as 0.000050 in. can be obtained on the thinnest strip rolled.

Permanent Record

When variations from the known standard swing more than the prescribed limit, the signal actuates circuits built into the gage that control screw-down adjustments to exactly compensate for thickness variations in the incoming strip. The signal that actuates this meter can also be fed into a continuous tape recorder of the stylus type so that a permanent record of all strip rolled may be retained.

Through the use of strip samples of known thickness the equipment may be easily and quickly calibrated. The standard sample is placed between the beam source and the pickup tube so that X-rays pass through it. A simple knob-adjustment brings the reading of the meter to zero.

ISOTOPES:

Industrial use of radioactive materials to be studied by ASTM.

The spreading use of radioactive isotopes in industry reflects the wide interest of industrialists in these byproducts of atomic research.

To acquaint industry with the problems connected with use of radioactive isotopes, the American Society for Testing Materials, agreed at its recent Detroit meeting to present several study papers at the annual meeting in June.

Papers will cover the following subjects:

1. Properties and Uses of Radioactive Isotopes
2. Possible Applications in ASTM Work
3. Laboratory Design, Health, Safety, and Personnel Training
4. Instrumentation
5. Management's View of Radioactivity
6. AEC Film on Methodology

In addition, an exhibit of representative instruments and equipment is being planned for continuous showing throughout the day the papers are presented.

NEW SBS WATERLESS WASHSTATION*

"brings the washroom to the worker"* for only $52.50 per unit

(F.O.B. Saginaw, Mich. Towel dispensers not included.)

SBS-30 Waterless Skin Cleanser and new type dispenser make possible portable wash-up units that save hundreds of man-hours . . . thousands of dollars!

SBS Waterless Washstation is a complete hand-washing unit that requires no plumbing because it uses SBS-30, remarkable Waterless Skin Cleanser that removes nearly every soil except lacquer.

- **locates close to** work areas in factories, warehouses and shops or near outdoor operations.
- **saves up to $720** per unit annually by reducing time workers spend off the job washing up.
- **helps keep workers** hands clean for better health and greater efficiency in industry.
- **reduces crowding** in washrooms at lunch time and new shift time.
- **eliminates use of** harmful and irritating solvents.

SBS Waterless Washstation is constructed of heavy steel and finished in grey-green enamel. Turret top holds SBS-30 dispenser and two of your own paper towel containers. Handy locking storage space in turret top removable cloth bag for used towels in base.

Polished aluminum dispenser has two-way feed adjustment that provides 1000 to 1500 washes before refilling. Easy to refill. One turn of the handle dispenses right amount of cleanser—no leakage, no soap waste.

SBS-30 Cleanser is easy to use—workers just rub it on, then wipe it off along with all dirt and grease. It leaves the hands clean, smooth and soothed.

Fill out and mail the coupon below for complete information about SBS Waterless Washstations and our 30-day no-risk money back trial offer.

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Chemical By-Products Division

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86

MAINTENANCE:

Simple splicing mold simplifies repair of battery connectors.

To help industrial truck battery users extend battery life with improved repair and maintenance programs, Gould-National Batteries, Inc., Trenton, N. J., has developed a simple mold with which connectors can be spliced directly on the job.

After the inter-cell connectors have been sawed, battery elements removed for repair and the repaired cell replaced in its rubber jar, the new splicing mold permits simple reconstruction of the sawed connector in its original form.

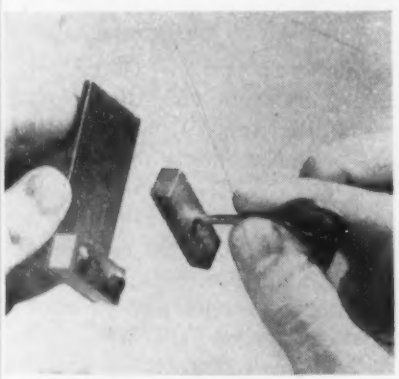
The mold consists of a simple plate with two side blocks—one fixed and the other movable. Before it is placed under the connector to be spliced the two sawed ends of the connector are chamfered to provide puddling space.

Chips for Support

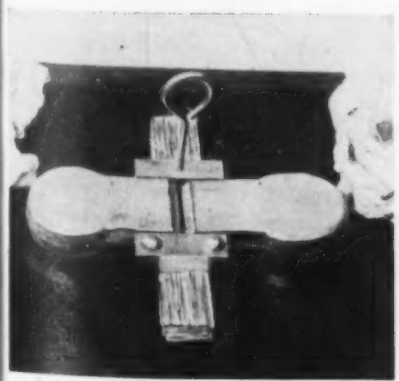
The mold is then supported from both sides by small wedges. Wood chips are satisfactory. The movable block of the mold is next brought into contact with the connector. It is then possible to use the lead-burning electrode to make the weld in the exact shape and form of the original connector.

The tip of the carbon electrode is touched to that side of the connector which is in the electrical circuit and held in that position until it is cherry red. Lead is added and the tip of the carbon electrode moved slowly through the puddle of molten lead to build the weld from the bottom through the top of the connector.

Turn Page



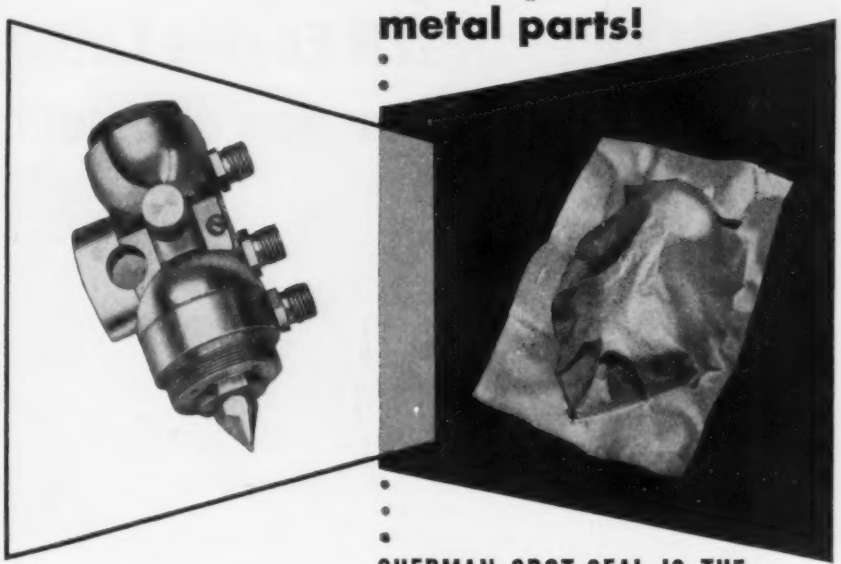
SIMPLE STEEL MOLD is used to repair battery connectors sawed in half for removal. Battery's own power is used for lead fusion.



CONNECTOR ENDS are chamfered, wood chips support mold in place, and moistened cloth protects adjacent parts and openings in preparing joint for welding.

New Way

to wrap metal parts!



SHERMAN SPOT-SEAL IS THE FASTEST WRAP KNOWN FOR PARTS OR ASSEMBLIES!

Goes on more easily than any other wrap, too. That's because Spot-Seal is a specially coated wrap that sticks only to itself. Wrap it around the part, press the sheet together . . . the part is sealed!

Spot-Seal answers the need for a quick, water-repellent, dust-proof, tamper-proof wrap, for one part or a whole assembly. Spot-Seal is ideal for assemblies like micro switches requiring dust protection, or loose parts which need a loss-proof wrap. Because Spot-Seal sticks only to itself, it will not mar finishes, requires no fastenings.

Switch to labor-saving Spot-Seal for convenient, protective packaging of metal parts, for shipping or storing. Write for free samples today, Dept. L. See for yourself the protection and quick-wrapping Spot-Seal gives.

Sherman PAPER PRODUCTS CORPORATION
NEWTON UPPER FALLS, MASS.
CHICAGO LOS ANGELES NEW YORK

SMALL TOOLS:

You can save money by sharpening taps correctly.

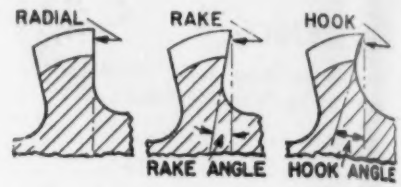
Taps sharpened incorrectly will not only dull quickly and cause oversize threads, but will throw up burrs and will bind and break prematurely.

Poor threads and breakage of taps can often be avoided by sharpening each tap according to the material worked. Taps of the same make and measuring exactly the same size will cut different threads even in the same metal if the cutting edges are sharpened differently.

First step is to sharpen the chamfered point of the tap so that all of it will contact uniformly. Otherwise, uneven heights will force the cutting burden on a lesser number of teeth, resulting in poor threads, more power consumption and high tap breakage.

Cast and Malleable Iron

When tapping cast iron and malleable iron, sharpen the tap with a radial rake, while for cast steel, manganese, molybdenum and vanadium alloys grind the rake angle between 10° and 15°.



CUTTING ANGLES ground in taps vary for materials in which the tap is to be used. Aluminum alloys require sharp hook. Laminated plastics, vulcanized fiber need negative rake.

It is also important to grind taps with the proper hook. Duralumin, moly-chrome steel, nickel-chrome steel, Allegheny and Monel metals can be tapped best with a hook up to 15°. Babbitt, bronze, copper and nickel-silver require a hook up to 20°. For tapping stainless steel, ground-thread taps sharpened with a hook of 15° have been found give most economical tapping.

Watch the Angles

The top rake is kept between 20° and 25°, the grinding angle between 10° and 25°, and the chamfer angle between 25° and 35°.

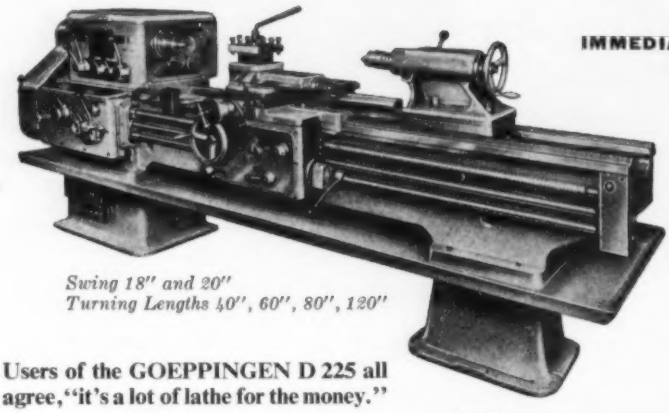
Aluminum alloys require a tap ground with a sharp hook on the teeth. The special taps used for laminated plastics and vulcanized fiber materials are not ground with a hook but with a negative rake of about 5° on the front. This prevents binding in the hole while backing out the tap.

Negative Rake

For brass, select a tap with a negative rake. High speed steel taps are more economical than carbon steel taps, provided the necessary high speed spindles are available in the shop.

Standard taps are satisfactory for aluminum, provided they are ground with the recommended hook. For plastics, it is best to select oversize taps with a slightly negative rake. Because of the abrasive characteristics in this case, many shops use small size taps which are chrome-plated or nitrided.

New high-speed, heavy-duty GOEPPINGEN Engine Lathe costs less than you'd expect



IMMEDIATE DELIVERY FROM STOCK

Swing 18" and 20"
Turning Lengths 40", 60", 80", 120"

Users of the GOEPPINGEN D 225 all agree, "it's a lot of lathe for the money."

That's what Goeppingen engineers designed it to be. And by concentrating on only one basic type, they brought it within the price range of the small as well as the large plant.

Rugged and fast for high-speed machining of large castings and forgings with carbide tools, the GOEPPINGEN is precise enough for use as a toolmaker's lathe. All lead and feed screws, dials and graduations are in inch dimensions. Accurate settings are maintained by single lever action of longitudinal and cross feeds carried in precision bearings.

Factory trained servicing is as close as your telephone from Orban Service Centers in Cleveland, Detroit, Newark. Stock parts from Cleveland.

SPECIAL DESIGN FEATURES

Extra-wide bed without gap adds greater swing diameter, handles work up to 21".

V-belt drive transmits power through 10 or 7½ h.p. motor to geared head...eliminates vibration. 18 spindle speeds 22-1120 rpm.

Hardened and ground gears and shafts automatically lubricated. *Drive shaft on headstock* has Ortlinghaus multiple disc clutch for forward and reverse motion; quick-acting mechanical brake.

Self-contained gearing unit for thread-cutting. Dial feed simplifies changes of feed and pitch. 48 threads up to 28 pitch *without change gears.*

Bondycop hydraulic copying attachments for 20", 40" and 60" lengths. Other attachments for taper turning; boring and thread cutting operations; patented self-centering rest for mass production work.

Write today for complete specifications.

KO KURT ORBAN COMPANY, INC.
205 E. 42nd St., N. Y. 17 • 4220 Prospect Ave., Cleveland 3 • 19450 James Couzens Highway, Detroit 35
1939 Santa Fe Ave., Los Angeles

MILLING:

Tungsten carbide insert blades speed milling of gear cases.

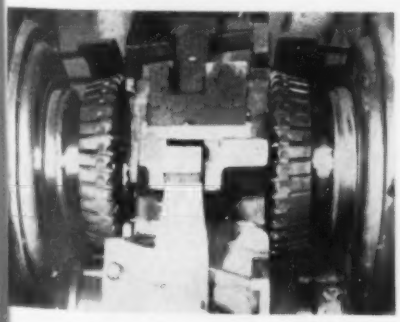
Straddle milling 3500 cast iron automatic transmission gear cases per tool grind is the record achieved on a 20-hp Davis Thompson drum-type mill using two units for rough milling and two for finish milling.

These four 12-inch diam cutters are "MF" axial face mills produced by Kennametal Inc. Latrobe, Pa. Each has 36 solid blades of Kennametal Grade K6. The mills are run at 26 ipm feed rate, 0.009-in. feed per tooth, 250 sfpm at 80 rpm. Average depth of cut for the roughing cutters is 3/16-inch on each side. For the finish cut about 1/32-in. of stock is removed per cutter.

Quickly Reconditioned

Under similar operating conditions, 3000 to 3500 pieces may be straddle milled before cutters require regrinding. Reconditioning time per cutter is 1 hr. Resharpening consists of diamond finishing both corner and face angles on the solid tungsten carbide blades. Snagging and roughing usually required on brazed tooth cutters are eliminated.

Only four parts make up the cutter: Body, blades, wedges, and nuts. These mills have three blades per inch on 8-in. diam and larger units. Blades are solid wedged-in, free from brazing strains. Wedge screws are one piece hardened alloy steel pulled up tight with Allenuts. There are no threads in the cutter body.



STRADDLE MILLING cast iron gear cases on Davis Thompson drum type mill using two MF face Kennamills for rough milling and two for finish milling. Cutters are 12 in. in diam with 36 solid wedged-in blades.

Turn Page

Two-In-One Cutters

In another instance, a large steel plant uses the mills as "two-in-one" cutters. They formerly milled flats on the 13-in. diam journals of 22-in. diam steel work rolls (35 to 40 Scleroscope) with a high speed steel inserted-tooth cutter.

Since this type of cutter has to be run a lower speed and feed, it required 8 hr to mill two flats per roll. The job is now processed in 1 hr with a 12-in. mill, having 20 solid tungsten carbide blades of Kennametal Grade K2S.

The operation is performed on a 20 hp Cincinnati Hydraulic side mill at 100 rpm with the Kennamill projecting about 12 in. beyond the machine face. Feed is 10

...ON CARAVAN AXLES

Rutted ground or high grade highway . . . equipment mounted on CARAVAN axles is ready to roll over any surface. These quality-built assemblies assure positive trail at high speeds as well as stability for the heaviest equipment over the roughest ground.

CARAVAN axles feature double-acting spring cushioned draw bar to minimize stopping and starting shock, sturdy solid steel axle beam construction, extra-heavy center arm stop blocks and heavy-duty steering knuckle. Wide inside wheel turning angle assures maximum maneuverability and eliminates jack-knifing.

CARAVAN units are available as single-axle two-wheel assemblies and as four-wheel running gear equipped with automotive type steering. They are recommended for mounting military and industrial equipment as well as field service and construction machinery weighing up to 14,000 lbs.

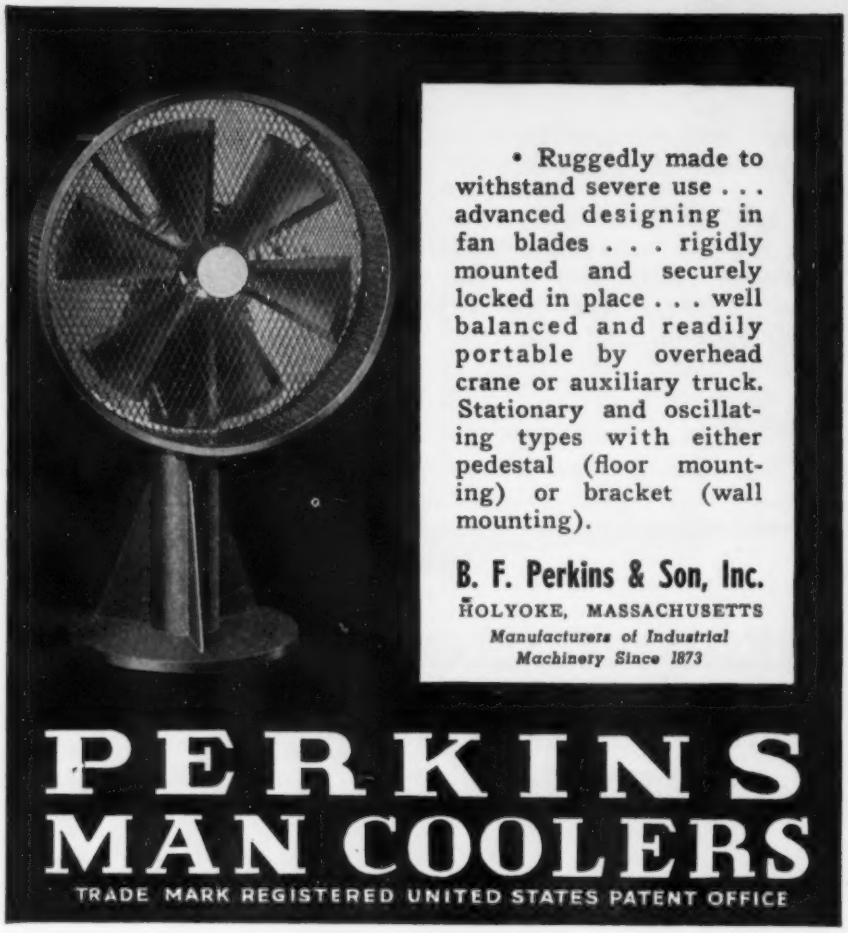
Write today for the new Bulletin No. 53 for further information.

1169-UM

UNITED

THE UNITED MANUFACTURING CO.

488 INTERSTATE STREET • BEDFORD, OHIO

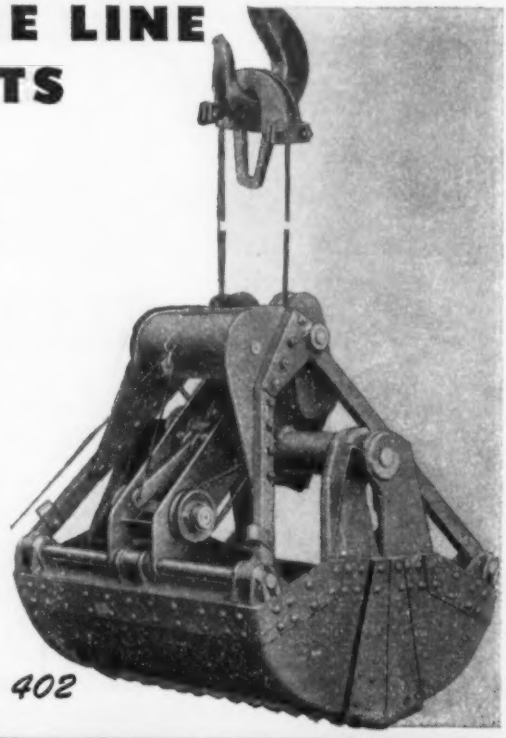


• Ruggedly made to withstand severe use . . . advanced designing in fan blades . . . rigidly mounted and securely locked in place . . . well balanced and readily portable by overhead crane or auxiliary truck. Stationary and oscillating types with either pedestal (floor mounting) or bracket (wall mounting).

B. F. Perkins & Son, Inc.
HOLYOKE, MASSACHUSETTS
Manufacturers of Industrial Machinery Since 1873

PERKINS MAN COOLERS
TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

ERIE SINGLE LINE BUCKETS



ILLUSTRATED is the hook-on type, for intermittent service. It is reeved and ready for operation on overhead traveling crane, monorail hoist, locomotive crane, derrick, ships tackle or any other hoisting device which has but a single hoisting drum available for bucket duty. Just slip the yoke over the crane hook.

Erie Single Line buckets are also available in the direct-reeved type for permanent installation. Describe your Single Line bucket need — we'll give you our recommendations for we build all types and sizes.

● *Write for Booklet 402*
Dept. A43

ERIE BUCKETS • *A Complete Line*
Erie Steel Construction Co., 468 Geist Rd., Erie, Pa.
BUCKETS • AGGREMETERS • PORTABLE CONCRETE PLANTS

ipm, chip load is 0.010-in. with a ⅛ to 7/16-in. maximum per pass depth of cut.

Because of the limited horsepower and unavoidably excessive cutter overhang, severe vibration was experienced when the 12-in. mill was first tried. This condition was minimized by a special setting of the 20 solid carbide blades as follows:

First, 10 blades were set up in alternate slots with their cutting end projecting approximately 0.032-in. from the cutter body. Then, the other 10 blades were inserted in the remaining slots and allowed to project approximately 0.040-in. beyond the first set.

To obtain the 9-in. wide by 13-in. long flat, total depth of cut is approximately 1½ in. This is made in five passes. First cut is 7/16-in. deep. Each successive cut is made at reduced depth as the size of the milled area increases. With only 10 blades doing the cutting and the depth of cut decreased for each successive pass, required horsepower is reduced and vibration greatly minimized.

After milling four or five flats, blades projecting farthest from the body are dropped back in their slots to permit continued milling with the remaining ten blades. This, in effect, provides two cutters in one. Only 0.010 to 0.015-in. edge wear need be removed to resharpen the tungsten carbide blades.

ELECTROLESS PLATING:

Kanigen process offers even, nonporous nickel plating.

Even, nonporous nickel plating on any part, regardless of shape, plus large savings in nickel are advantages claimed for General American Transportation Corp's new Kanigen process of chemical plating.

General American set out to find a better way of insulating the inside of tank cars against "iron pickup." The chemical plating method was studied and proved satisfactory.

Tests conducted by General American showed the Kanigen process deposited a uniform thick-

ness of plating without regard to size or shape of the items plated. In almost every case the job was done with ½ to 1/3 less nickel than would ordinarily be used.

Some notes on the process made by an IRON AGE editor indicate:

1. It is strictly an immersion process.

2. Cleaning prior to plating is essentially the same as for electrolytic plating.

3. Price will average somewhere between 50¢ and $1.00 per mil per sq ft, depending on amount to be plated and handling problems involved.

4. The deposited surface begins to soften at about 400°C and becomes very soft at 700°C.

5. Finish is very hard and brittle—not satisfactory for parts to be flexed in service.

6. Temperature of the plating bath is about 210° to 212°F.

POWDER CUTTING:

Manganese-bronze castings cut rapidly with blowpipe.

Manganese-bronze castings 13 in. thick are cut up for remelting by powder-cutting in less than half the time needed to cold-saw similar castings that are only 4 in. thick. Reclaiming the 3 tons of metal for commercial castings saves one foundry about $2000, since the price of manganese-bronze is about $700 per ton.

MANGANESE-BRONZE castings are easily cut in sections for remelting with this Oxweld powder-cutting blowpipe.

FINGERS MOVE TONS...

INCHES OR FEET WITH THIS FLOOR OPERATED MAGNETIC CONTROLLED

EUCLID CRANE

Spot-Positioning thru ease of accurate control is an outstanding performance feature of this 25 ton crane equipped with *E C & M Frequency Relay Dynamic Lowering Control. Non-overhauling loads with empty or slightly loaded hook start down slowly since weak "down power" is permissible. Euclid builds cranes in a range of styles and capacities to meet varied requirements.

*The Electric Controller & Mfg. Co.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST CO.

1361 CHARDON ROAD • EUCLID, OHIO

a Bigger, Better WISCONSIN

HEAVY-DUTY Air-Cooled ENGINE

16% More Power For Your Equipment

The NEW Model VG4D 25 to 36 H.P.

MORE Power TO FIT THE JOB

MORE Power TO FIT THE MACHINE

Complete Power Unit with Clutch Reduction.

Another engineering achievement . . . the NEW Model VG4D V-type 4-cylinder Wisconsin Heavy-Duty Air-Cooled Engine, increasing the power range to 36 hp. — a power gain of more than 16% over the VP4D, former top engine in the line.

The NEW Model VG4D is an exceptionally smooth-running, even-firing engine. Its light weight and compactness in design simplify the problem of engine installation on modern equipment where weight and space limitations are important factors.

Every one of the traditional Wisconsin 4-cylinder features are built into this new model. These include, to name a few, tapered roller main bearings, dynamically balanced forged crankshaft, mirror finish on crank pins, Stellite-faced exhaust valves and valve seat inserts and honed cylinders for long, dependable, heavy-duty engine life.
The Model VG4D engine is definitely Tops in Performance, delivering a maximum of power per pound of engine weight, at minimum operating and maintenance costs.
We invite your request for complete detailed specifications.

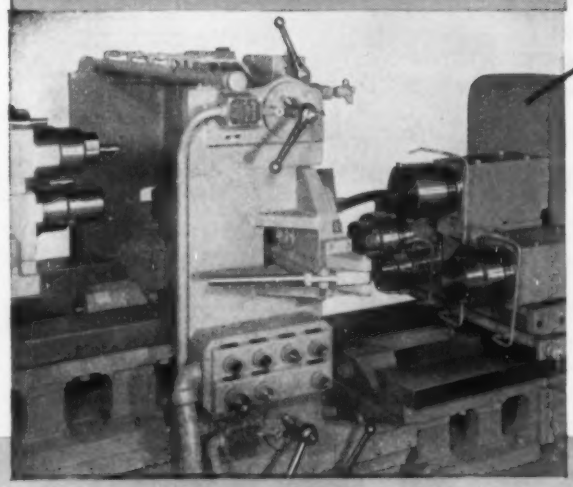
MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

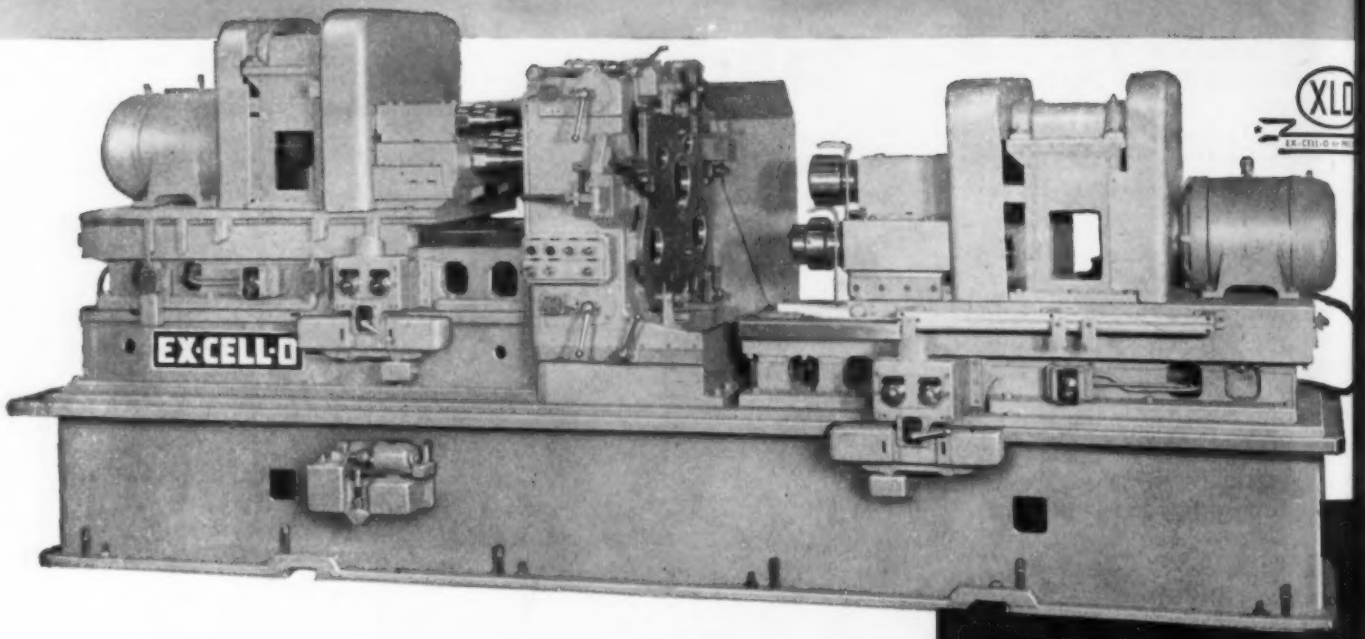
MILWAUKEE 46, WISCONSIN

Individual spindles are used for each bore to insure accuracy of location.



27 PRECISION OPERATIONS ON 9 HOLES IN ONE CYCLE

Another example of **EX-CELL-O** PRECISION ENGINEERING



SITUATION: The part is a magnesium center plate for a gear box. It's 27½" high and 30½" wide, has holes varying in size from 1⅛" to 6 15/16". Operations are semi-finishing, finish-boring and chamfering 8 holes, and finish-boring, plunge-facing a shoulder and chamfering the 9th hole, which is blind—a total of 27 precision operations.

SOLUTION: The use of this special precision boring machine makes it possible to complete all operations in one cycle, and to hold the required limits. The total tolerance on each of 9 bore diameters is .001", and the location of the bores are held within plus or minus .001".

For suggestions on your precision machining problems, call your Ex-Cell-O representative or contact Ex-Cell-O in Detroit.

Special Ex-Cell-O Precision Boring Machine

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT.

Peak Demand Stronger Than Record Steel Output

Consumers use steel faster than it can be delivered . . . But some doubt demand will last through second half . . . Pass 10-million-ton mark in March . . . Mills take time on price hikes.

This week the steel market is hotter than a firecracker. Although producing at a faster rate than ever before in history, the industry is unable to satisfy all demands for tonnage.

Steel consumers, feverishly pressing competitive spring production drives are in some cases actually chewing up steel faster than it can be delivered. Short-term pressure for delivery is as intense as it has been for many months.

Optimism Is Guarded . . . The long-term outlook is one of guarded optimism. Operations are expected to continue at reasonably high levels throughout the year. But there are some areas of doubt in the second half. Some large appliance makers, who had recently stormed back into the conversion market full force, are shying away from second half commitments.

They still expect business to be good, but they are not convinced that it will be necessary to continue paying double or more mill price to keep production going.

Set New Record . . . The terrific production pace of the steel industry makes their judgment look good. For the first time in history steel production has passed the 10-million-ton mark in a single month (March). If consumer demand holds as expected this record will probably be short-lived.

Even though March is usually a peak period of steel production, new capacity still being added at a fast clip will permit output to reach still greater heights.

Ore Season Opens . . . Great production efforts have not sapped the strength of the industry. Maintenance has in most cases been well scheduled and carried out with a minimum of down-time. Raw materials, including scrap and ore, are in adequate supply. There is little fear that solution of the seventh-wage-round question will interfere with production.

At least half of the Great Lakes ore fleet moved northward this week as the 1953 shipping season got underway. With an expanded fleet, including faster boats, off to an early start a record ore movement to Lower Lake ports may be in the making.

Price Front Quiet . . . The steel price front is quiet. Though some producers are obviously champing at the bit, major mills are still in no great hurry to make adjustments. Major price changes may be 4 weeks or more away. It seems clear that some producers want to first get a line on expected wage demands which will be known by May.

Mills are still awaiting word from Washington as to tonnage requirements for military and atomic energy under the new Defense Materials System. Meanwhile, third quarter defense business is being booked on basis of old set-asides under the Controlled Materials Plan. Producers are hoping actual rated tonnages won't be too different from old percentage set-asides—despite conflicting and confusing reports from Washington.

Fill Books Fast . . . Third quarter books on various products are being filled almost as fast as they are opened. Clamor for certain popular products still not being booked for third quarter is terrific.

There seems no question that all major products will be fully booked with little difficulty. Mills will then be watching carefully to see if cancellations start showing up from customers.

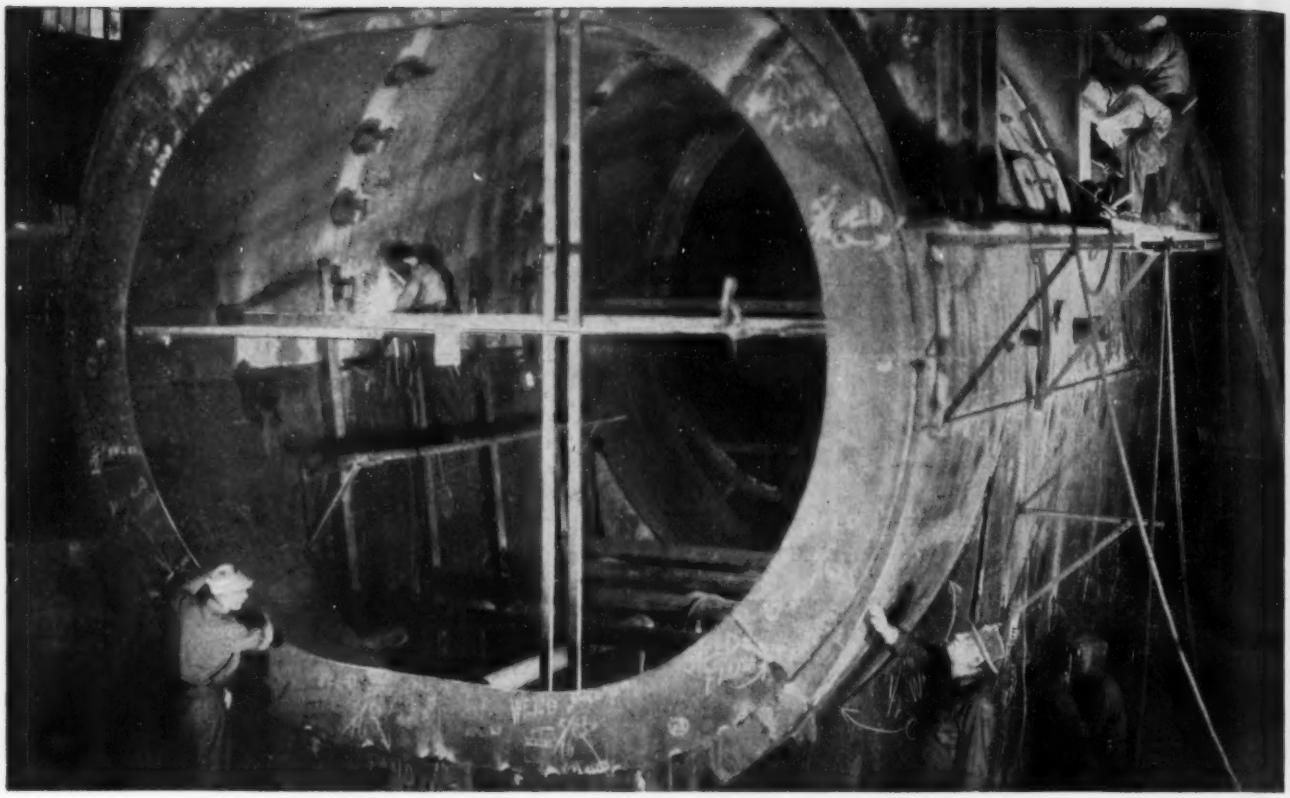
Autos Pace Market . . . The auto industry is still pacing the torrid market. After producing 1.5 million units in first quarter, automakers have raised their production sights to 1.8 million in second quarter. With still lean inventories on Apr. 1, it's not hard to understand why they are exerting so much pressure on mill suppliers.

Appliance makers are also pressing short-term demands vigorously. Added to their list of regular breadwinners are some new product hopes for the future. Among these are air conditioning and home freezers.

Firming Up . . . Farm demand is undergoing a seasonal pick-up. Demand for wire products, including nails and staples, is noticeably firmer. Farm equipment, though picking up seasonally, is a bit disappointing.

Construction activity continues at high level. Declining industrial construction is being offset by roads and institutional buildings. A number of small fabricators who seemed in trouble early this year have fattened their order books by price cutting in January and February.

Steelmaking operations this week were at 100.5 pct of rated capacity, a drop from last week's revised rate of 102.0 pct.



This formula helps an entire industry!

More and more firms in the chemical industry are coming to rely on this formula:

Barium Steel Corporation—best source for structural and steel plate, fabricated forms and finished products of steel, aluminum, magnesium, Fiberglas, plastics.

The reason for this conviction is that the group of strategically located companies comprising Barium Steel Corporation serves the chemical industry as a *unified* source for its structural and equipment requirements, controlling quality from blast furnace to end product, working as a self-contained supplier of urgently needed material.

For example, in the scene above, workers at Barium's Central Iron and Steel Company are building a giant condenser shell from Central plate, which is also fabricated into tanks, heat exchangers and piping for the process industries. Other Barium subsidiaries (see photos below) supply the chemical field with a number of important components.

Whatever your industry, Barium can provide you with the same kind of service. For details, write Barium Steel Corporation, 25 Broad Street, New York City. No obligation.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

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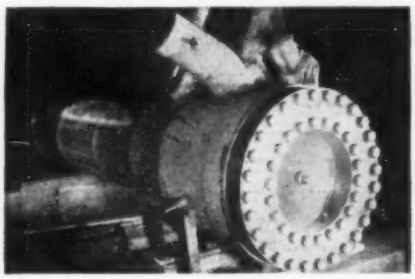
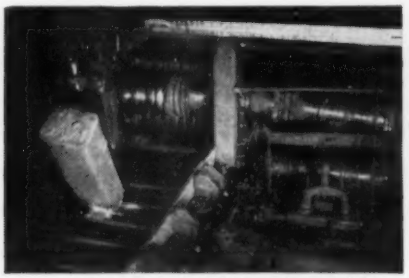
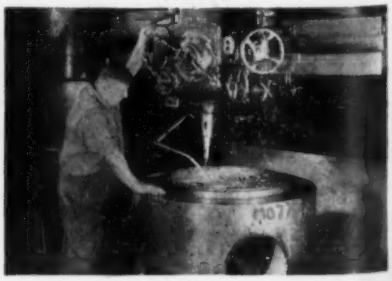


THE HEAD of this Lummus Co. heat exchanger unit is securely fastened by bolts and studs specially made by Barium's Erie Bolt and Nut Co. Specialty studs for the industry are also produced by Barium's Bayonne Bolt Corp.



THIS INGOT in the blooming mill at Phoenix Iron and Steel Co. will ultimately become structural steel, which is widely used in the chemical industry for the construction of new processing equipment.



HEAT EXCHANGER manufacturers like Griscom-Russell Company take heavy forgings of Barium's Industrial Forge & Steel, Inc., and fabricate them into parts that resist temperature, high pressure, and the corrosive action of chemicals.

Market Briefs and Bulletins

Make **Business Survey** . . . National Assn. of Purchasing Agent's March business survey indicates overall industrial activity is continuing at the high rate of previous months. The association reports production is growing, though at a much slower rate than in January and February. Backlogs are declining at a slightly accelerated pace. Buying policy is reported as very conservative, indicating some lack of confidence in the current price structure. Price increases since decontrol outnumber price drops by a 4 to 1 ratio.

Strike . . . Pittsburgh district plants of U. S. Steel Corp. were losing 25,000 ingot tons of production early this week due to a railroad strike. The walkout was on the Union Railroad, which serves the steel company's plants. About 30,000 men were affected.

Raise Prices . . . Jones & Laughlin Steel Corp. has boosted prices of its drums and pails effective Apr. 1. The increases range from $2.40 per 100 5-gal pails to 30¢ for a 55-gal drum at the Kansas City producing point. Steel price increases allowed by Office of Price Stabilization last year did not adequately cover the rise in labor costs, J. & L. said.

Price Reduction . . . Prices of some sizes of electricweld mechanical tubing have been reduced 10 pct. The reduction applies to tubing 2-in. and under, 14 gage and lighter in lots of 20,000 ft and over, round tubing only. Republic, Jones & Laughlin, and Armco were among producers making reductions.

Wasn't Stainless . . . On p. 74 of the Mar. 19 issue, Republic Steel Corp.'s line of steel kitchens was inadvertently labeled stainless. These units are made from porcelainized high quality carbon steel sheets. Republic, which makes no kitchen appliances, started retailing the steel kitchen cabinets early this year.

Will Get More Nickel . . . Production and sale to the U. S. of a minimum of 50,000 tons of nickel by mid-1962 have been assured as a result of a government contract with Falconbridge Nickel Mines Ltd., Toronto. The Canadian firm will begin fulfilling the contract by delivering 1000 tons or more by the end of this year. Contract also provides that the U. S. will get up to 1000 tons of cobalt by June 30, 1962, and as much as 26,000 tons of refined copper by Dec. 31, 1958.

Reassign Plant . . . Because of cutbacks in the jet engine program, General Motors has assigned its Buick Coldwater Road plant to its Ternstedt Div. The plant, still under construction, was originally slated for subassembly work on Wright J65 jet engines which Buick is building. GM now plans to operate the plant as a dual purpose facility in which both automotive hardware and defense products will be manufactured.

Wire Atomic Energy Plant . . . Reynolds Electric Co., Inc., Albuquerque, N. M., and Newbery Electrical Corp., Los Angeles, will perform electrical work costing about $100 million at the new Pike County, Ohio, atomic energy plant. The firms signed to handle the project jointly under terms of a cost-plus-fixed-fee subcontract awarded by Peter Kiewit Sons Co., general construction contractor.

Shut Down Openhearths . . . U. S. Steel Corp.'s No. 3 openhearth shop at Homestead, Pa., was shut down last weekend pending safety inspection. The old shop was built in 1898 and may be on its last legs. All of its 20 furnaces, with capacity of 1.06 million tons annually, were operating when the shutdown was ordered. It will take 2 weeks to determine whether the shop can be restored to operating condition.

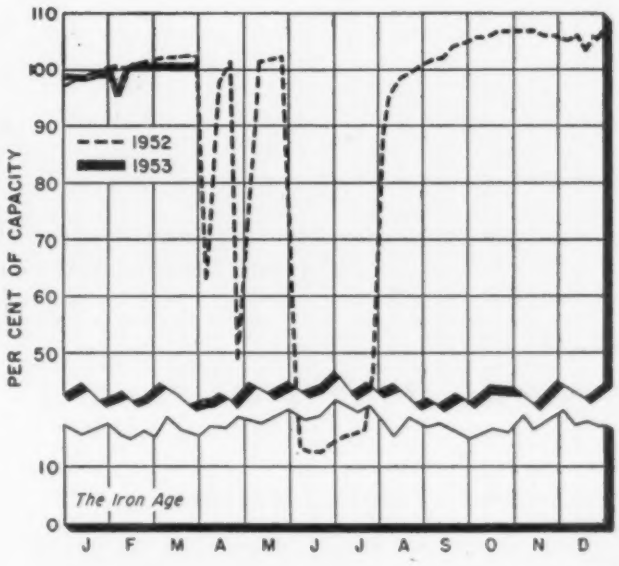
STEEL OPERATIONS

District Operating Rates

District	Week of Mar. 29	Week of Mar. 22
Pittsburgh	102.0	108.0*
Chicago	105.0	106.0*
Philadelphia	94.0	94.0
Valley	102.0	102.0*
West	110.5	110.5*
Cleveland	96.5	94.0
Buffalo	94.0	94.0
Detroit	105.0	107.0*
Birmingham (South)	99.0	98.5
Wheeling	102.0	102.0
South Ohio River	88.0	88.0
St. Louis	80.5	88.0
East	104.0	96.0*
AGGREGATE	100.5	102.0*

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



Buyers Wait End of Copper Muddle

Prices now free a month . . . Range hasn't narrowed much and consumers are feeling it . . . Buyers went scrambling for cheapest copper when tickets went out—By *R. L. Hatschek.*

A month has now passed since copper prices were released from the Office of Price Stabilization yoke. And still the confusion persists. One of the arguments for decontrol was to permit the red metal to seek its own price level through the law of supply and demand. It has found several.

Range now paid by consumers runs from 27.50¢ per lb to 36.50¢—not much narrower than the 24.50¢ to 36.50¢ range paid under ceilings.

List Prices . . . The big domestic mine producers are charging 27.50¢ (Kennecott Copper Corp.), 30¢ (Phelps-Dodge Corp.), and 32¢ (Anaconda Copper Mining Co.). Phelps-Dodge last week lifted its price 1.5¢ from the 28.50¢ price first quoted after decontrol.

Custom smelters are pricing domestic electrolytic refined copper at up to 34.50¢. And the range for foreign copper is 34.50¢ to 36.50¢. All prices are on a delivered Connecticut Valley basis.

Buyers Scramble . . . Facing such a variety of prices purchasing agents naturally scrambled to get on the order books of the lower priced producers as soon as April allocations were received — even before in some cases. Result has been a "Sold Out" sign hung up by some suppliers.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in March based on quotations appearing in THE IRON AGE were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	30.577
Lake Copper, delivered	32.125
Straits tin, New York	$1.2144
Zinc, East St. Louis	11.029
Zinc, New York	11.859
Lead, St. Louis	13.204
Lead, New York	13.404

While no Chilean 36.50¢ copper has yet been reported sold, it seems a sure bet that somebody will soon have to buy that.

When the metal was first decontrolled everyone in the trade freely predicted a short period of some price disorder, after which the price would soon settle down to a single figure of probably 30¢ per lb. That is still expected. But the question now is: "When?"

Aluminum Vs. Copper . . . Meanwhile, these price shenanigans in copper have been watched happily by members of the aluminum business. One is even reported to have claimed that the copper price is the best thing that ever happened to aluminum.

The light metal has been showing good stability since decontrol. Primary metal prices didn't budge an inch though secondary and scrap acted much the same as secondary copper and brass.

Mercury Rebounds . . . Quicksilver prices, which had been slipping off steadily in recent weeks, took a sharp upward turn last week. Quotation in the last issue of THE IRON AGE was $195 to $197 per 76-lb flask—this week it's $200 to $203. Main reason for the sudden strength was the rumored intent of both the U. S. and British governments to increase stockpile buying.

Tin Eases . . . A gradual slipping of demand for tin has been noted in the past week or two and it has finally resulted in a bit of a slip in prices. Price at deadline was $1.21, off ½¢ from the Reconstruction Finance Corp. resale price. Possibility is that this may slip a bit more.

Zinc Tone Dims . . . Recent brightness in the London market has reversed itself and the price at the end of the week was equivalent to almost 1¢ less than the New York figure. But domestic feeling is still good and demand continues fairly high.

Lead is also fairly strong, though not solid enough for higher prices yet. Sales last week neared 13,000 tons, an increase of better than 4000 tons from the previous week.

Magnesium Shows Off . . . Education. That's the aim of the magnesium industry's big show in Washington this week. With production well ahead of consumption, the Magnesium Assn. is trying to teach both industry and the public all it can about our lightest structural metal.

All sorts of products were displayed as well as methods of fabrication. The association has done a good job of rounding up exhibitors from the Armed Forces and industry, from the U. S. and abroad. It's a good show.

NONFERROUS METAL PRICES

	Mar. 25	Mar. 26	Mar. 27	Mar. 28	Mar. 30	Mar. 31
Copper, electro, Conn.	27.50-34.50	27.50-34.50	27.50-34.50	27.50-34.50	27.50-34.50	27.50-34.50
Copper, Lake, delivered	32.125	32.125	32.125	32.125	32.125	32.125
Tin, Straits, New York	$1.21½	$1.21½	$1.21¼	....	$1.21	$1.21*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices.
*Tentative.

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Trained specialists combine their knowledge and talents to produce alloys to exacting standards. Every heat of metal is under skillful metallurgical control from the "idea to the ingot."

If the standard master alloys which we manufacture are not suited to your needs, our research and production departments will work together to produce special alloys which will comply with your specifications. When you buy from Alter Company, YOU CAN BE SURE of unexcelled quality. Any product which bears our name is backed by over fifty years of experience and integrity.

STEEL MILL AND FOUNDRY ALLOYS

Copper Iron 70/30
Copper Iron 90/10
Copper Iron 95/5
Pure Copper Shot
Nickel Copper Shot 50/50
Nickel Copper Shot 70/30
Monel Ingot
Monel Shot
Ferro-Nickel 50/50 Ingot and Shot
Nickel Chrome 70/15 Ingot
Nickel Chrome 60/15 Ingot
Nickel Chrome 35/15 Ingot
Chromium Copper 5%
Chromium Copper 10%

ALTER COMPANY 1701 Rockingham Road, DAVENPORT, IOWA

Nonferrous Prices

(Effective Mar. 31, 1953)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢. 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢. 0.032-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.4¢ to 80.3¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 39.7¢ to $1.27; 36 to 38, 47.0¢ to $1.86.

Rod, Rolled: 1.064-in. to 4.5-in., 2S-F 3S-F, 41.0¢ to 36.6¢; cold-finished, 0.375-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 38.3¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32-in., 58.4¢ to 45.9¢; ⅜ to 1½-in., 45.3¢ to 42.6¢; 1 9/16 to 3-in., 42.0¢ to 39.3¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374-in., 2S, 43.2¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

Roofing Sheet: Flat, per sheet, 0.019-in., 28 x 72 in., $1.247; x 96 in., $1.662; x 120 in., $2.077; x 144 in., $2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.3¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ⅛ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks		57	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	47.01		49.08
Copper, h-r	48.98	45.33	
Copper, drawn		46.58	
Low brass	44.89	44.58	
Yellow brass	42.03	41.72	
Red brass	45.91	45.60	
Naval brass	46.31	40.37	41.63
Leaded brass			39.31
Com. bronze	47.46	47.15	
Mang. bronze	50.03	43.92	45.48
Phos. bronze	68.57	68.82	
Muntz metal	44.21	39.77	41.02
Ni silver, 10 pct	55.16	58.84	61.95

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.50
Aluminum pig	19.50
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be	$37.72
Beryllium aluminum 5% Be, Dollars Per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	27.50 to 34.50
Copper, Lake, delivered	32.125
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$175 to $185
Lead, St. Louis	13.30
Lead, New York	13.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$200 to $203
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	85.25
Tin, New York	$1.21
Titanium, sponge	$5.00
Zinc, East St. Louis	11.00
Zinc, New York	11.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	29.50
No. 120	28.75
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.25
88-10-2 ingot	
No. 210	44.75
No. 215	41.75
No. 245	36.00
Yellow ingot	
No. 405	24.00
Manganese bronze	
No. 421	31.00

Aluminum Ingot

(Cents per lb del'd., 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	25.25-26.50
0.60 copper, max.	25.00-26.00
Piston alloys (No. 122 type)	23.50-24.00
No. 12 alum. (No. 2 grade)	23.00-24.00
108 alloy	23.25-24.50
195 alloy	23.50-24.00
13 alloy (0.60 copper max.)	24.50-25.50
ASX-679	23.50-24.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	24.25-26.00
Grade 2—92-95%	23.25-24.50
Grade 3—90-92%	22.50-23.50
Grade 4—85-90%	21.50-23.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	45.14
Electrodeposited	37.98
Flat rolled	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	79.50
Roller, depolarized	80.50
Cadmium	32.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	27⅛–29⅞	26⅝–29¼
Yellow brass	20⅝–22⅝	19½–21½
Red brass	24 –26¼	23¼–25⅞
Comm. bronze	22⅝–24⅞	21⅞–24⅛
Mang. bronze	19¼–20⅝	18½–19⅝
Brass rod ends	20⅝	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	28½
No. 2 copper wire	26½
Light copper	25
•Refinery brass	25

• Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	27
No. 2 copper wire	25
Light copper	23½
No. 1 composition	23
No. 1 comp. turnings	22½
Rolled brass	18
Brass pipe	18
Radiators	17 —17½
Aluminum	
Mixed old cast	15 —15½
Mixed new clips	16½—17
Mixed turnings, dry	14½—15½
Pots and pans	15 —15½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	25½—26
No. 2 heavy copper and wire	24 —24½
Light copper	22 —22½
New type shell cuttings	22 —22½
Auto radiators (unsweated)	15 —16
No. 1 composition	18
No. 1 composition turnings	18½
Unlined red car boxes	17 —18
Cocks and faucets	16 —17
Mixed heavy yellow brass	13 —13½
Old rolled brass	14½—16
Brass pipe	17 —17½
New soft brass clippings	18 —18½
Brass rod ends	17 —17½
No. 1 brass rod turnings	16½—17

Aluminum

Alum. pistons and struts	6½— 7
Aluminum crankcases	9 —10
2S aluminum clippings	12 —13
Old sheet and utensils	9 —10
Borings and turnings	7½— 8
Misc. cast aluminum	9 —10
Dural clips (24S)	11 —11½

Zinc

New zinc clippings	6½
Old zinc	5
Zinc routings	3
Old die cast scrap	4

Nickel and Monel

Pure nickel clippings	58 —60
Clean nickel turnings	58 —60
Nickel anodes	58 —60
Nickel rod ends	58 —60
New Monel clippings	33
Clean Monel turnings	25
Old sheet Monel	30 —32
Nickel silver clippings, mixed	15 —16
Nickel silver turnings, mixed	14 —14½

Lead

Soft scrap, lead	10¼—10¾
Battery plates (dry)	5¼— 5½
Batteries, acid free	4

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	100
No. 1 pewter	70
No. 1 auto babbitt	55 —60
Mixed common babbitt	13½—14
Solder joints	17¼
Siphon tops	60
Small foundry type	17½—18
Monotype	13 —13½
Lino. and stereotype	12 —12½
Electrotype	10¼—10½
Hand picked type shells	8¼— 8½
Lino. and stereo. dross	4½
Electro dross	4

You know his first concern is you...

CONFIDENCE is born in one look at the eyes... the set of the shoulders..."the cut of his jib". In a second, you *know* he's had years of training and weathered it well. You know you couldn't be in better hands... and if anyone can get you there, *he will.*

Yes, it takes years to build confidence like this, in any line. And the whole organization of Bristol Brass . . . young yet experienced . . . is keyed to keep the confidence that any promised shipment of Bristol Brass sheet, rod, or wire will get there at the promised time, if it's humanly and mechanically possible to do so. In fact, that's what "Bristol-Fashion" means . . . a term still in use that came to be first applied to the old clipper ships out of Bristol, England . . . always shipshape, correctly manifested, *and right on time.*

. . .

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

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No. 2 Steel, Bundles on Downtrend

Most areas register declines in No. 2 grades. Some areas wait for the axe to fall again . . . Blast furnace grades on the same downward trail . . . Some markets are slow.

The steel axe was falling on prices of secondary scrap grades this week. In Pittsburgh last week two consumers bought No. 2 steel and bundles at $2 under former prices. Meanwhile, some scrap centers were marking time on trading.

No. 2 steel and bundles were weaker in Philadelphia and New York and the trade there was circulating reports that another drop was coming. The trend on No. 2 bundles was down in Detroit where prices fell another $1 to $2 —and in Cleveland No. 2 steel sank $2 while No. 2 bundles went $4 below ceiling.

Birmingham scrap men reported consumers trimming prices $2 all around and not buying all grades. No. 2 steel and bundles also flopped in St. Louis where demand was apathetic. Buffalo and Cincinnati also saw No. 2 weakness translated into price dips. In many areas blast furnace grades were following the downroad.

Pittsburgh — Some brokers are thinking in terms of a soft market through most of the summer. Two consumers last week bought No. 2 steel and No. 2 bundles at $2 under previous prices. Top grades held unchanged but consumers are not reaching out for material. Shutdown of U. S. Steel's No. 3 openhearth shop at Homestead Works for at least 2 weeks pending detailed inspection to determine whether the plant is safe is a blow at scrap consumption. The shop's capacity is 1.06 million tons per year.

Chicago — The market started optimistically this week with some increase in interest in railroad grades which had begun to drift slightly last week. Generally healthy tone covered steelmaking grades and to some extent electric furnace where spot overceiling sales were being made. Blast furnace continued stale. Asking prices were sinking at press time on these grades, though new sales at $27 were still being made.

Philadelphia — No. 1 steel continued quiet this week at the same prices. But No. 2 heavy melting was off to a range of $40 to $41 and No. 2 bundles are quoted $2 lower. Cast grades show little change except a $2 cut in unstripped motor blocks—and even then they're backing up in yards.

New York—The market was calm —suspensefully so because word was circulating that prices of No. 2 steel and bundles had been dropped. Shipments of No. 2 material to a leading mill were reported resumed by the trade. Cast prices remained unchanged with the exception of unstripped motor blocks. Blast furnace was weaker pricewise.

Detroit—No. 2 bundles broke another $1 to $2, widening the gap between No. 2 and No. 1 grades to a point much greater than the historical differential. This indicates mills are overloaded on secondary grades, but need top quality scrap and are willing to pay the difference. Direction industrial scrap is backfiring slightly in that a major buyer here is having to pay higher than the free market for turnings.

Cleveland — More realistic price spread was established this week as No. 2 steel dropped $2 to $41.50. Pressure of increasing rejections and slow mill buying also sent No. 2 bundles down $4 below the old OPS ceiling at $39.50. Rail specialties weakened slightly as buyer resistance continued. Rails 3 ft and under and 18-in. crops were quoted $1 lower at $62 and $63. Recent mill survey in the area showed inventories were not depleted at all during February.

Birmingham—Scrap market turned weaker this week with mills cutting prices $2 all around but not taking all grades. Barges are loading shipments at TVA points for the Pittsburgh district at prices in line with those paid by steel mills in the Birmingham area. Some cast and electric furnace scrap moved this week, but brokers called the movement slow.

St. Louis — Market for No. 2 heavy melting steel continues weak. While there is no buying by district steel mills, brokers are buying at $2 below ceiling prices for sale with a $2.50 springboard at ceiling prices in Chicago. No. 2 bundled sheets are sharply off because of heavy production, limited demand and a feeling by mills that there should be a real spread between that item and No. 2 heavy melting steel.

Cincinnati—Switch to straight delivered basis on April buying sent No. 1 heavy melting up $1 to $45.50. Secondary grades followed pattern set in most other steel producing centers when No. 2 heavy melting slumped from $43.50 to $42, and No. 2 bundles dropped $3.50 to $40 delivered. Weak turnings market was also tightened by the switchover as short turnings and cast iron borings fell $3 to $33.

Buffalo — Much weaker tendency prevailed in the scrap market here as two top mill consumers placed new orders at prices declining $2 a ton for No. 2 bundles and blast furnace items. No. 2 bundles dropped to $41.50, while borings and turnings fell to $36.50. Machine shop turnings were excluded from new business.

Boston — Market slipped back to the old ceiling levels for No. 1 steel making material. No. 2 heavy melting is still at $33.17 but the grade is weakening and it's felt in trade circles that this price will soon come down. Meanwhile, some No. 2 bundles have been coming through in poor quality.

West Coast . . . Record high deliveries to dealers by collectors have tapered off due to low price and increasing agricultural activities. All dealer offerings to mills are being accepted. Shipload quantities of Australian cast enters Los Angeles under local prices. Los Angeles dealers were notified No. 2 heavy melting, predominant tonnage in the area, would drop $2 to $24 Apr. 1.

THE ROLE OF SCRAP
IN THE FLOW OF OIL
Sucker rods range from ⅞ inch to 1 inch in diameter. They are 30 feet long and linked end to end by a threaded connection. MATERIALS: AISI, A3310 (3.5% nickel, 1.5% chromium)

"SUCKER RODS"

keep nation's 400,000 wells pumping daily

More than 400,000 oil wells are being pumped in the United States today from depths averaging 3600 feet. To pump this oil to the surface, oil men depend on "sucker rods" to accentuate the plunger action of an oil field pump. It is made of 55% special steel scrap and 45% pig iron.

These special steels require special scrap of known analysis — a problem particularly suited to our experience, personnel, equipment and the strategic location of our field offices.

Possibly our facilities may help you solve a special problem in iron or steel scrap.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

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BIRMINGHAM, ALA.	DETROIT, MICH.	PITTSBURGH, PENNA.
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CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap Prices

(Effective Mar. 31, 1953)

Pittsburgh

No. 1 hvy. melting	$44.50 to $45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.50 to 45.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	30.00 to 30.50
Mixed bor. and ms. turns.	30.00 to 30.50
Shoveling turnings	36.00 to 37.00
Cast iron borings	36.00 to 37.00
Low phos. punch'gs, plate	50.00 to 51.00
Heavy turnings	43.00 to 44.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	48.00 to 49.00
Rails 2 ft and under	52.00 to 53.00
RR. steel wheels	54.00 to 55.00
RR. spring steel	54.00 to 55.00
RR. couplers and knuckles	54.00 to 55.00
No. 1 machinery cast.	52.00 to 53.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	42.00 to 43.00
Malleable	49.00 to 50.00

Chicago

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	41.00 to 43.00
No. 1 factory bundles	44.00 to 45.50
No. 1 dealers' bundles	43.00 to 44.00
No. 2 dealers' bundles	38.00 to 40.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Low phos. forge crops	50.00 to 51.00
Low phos. punch'gs, plate	48.00 to 49.00
Low phos. 3 ft and under	46.00 to 47.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	52.00 to 53.00
Rerolling rails	56.00 to 57.00
Rails 2 ft and under	58.00 to 59.00
Locomotive tires, cut	51.50 to 52.00
Cut bolsters & side frames	50.00 to 51.00
Angles and splice bars	53.00 to 54.00
RR. steel car axles	64.00 to 65.00
RR. couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	45.00 to 47.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	40.00 to 41.00
Cast iron car wheels	44.00 to 46.00
Malleable	44.00 to 45.00
Stove plate	39.00 to 40.00

Philadelphia Area

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	30.50 to 31.50
Mixed bor. and turn.	35.50 to 36.50
Shoveling turnings	35.50 to 36.50
Clean cast chem. borings	41.50 to 42.00
Low phos. 5 ft and under	45.50 to 46.50
Low phos. 2 ft and under	47.50 to 48.50
Elec. furnace bundles	45.50 to 46.50
Drop forge trimmings	41.50 to 42.50
Heavy turnings	42.50 to 43.50
RR. steel wheels	54.00 to 54.50
RR. spring steel	54.00 to 54.50
Rails 18 in. and under	61.00 to 62.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	43.00 to 44.00
Cast iron carwheels	47.00 to 49.00
Malleable	49.00 to 50.00
Unstripped motor blocks	33.00 to 34.00
No. 1 machinery cast.	48.00 to 50.00
Charging box cast.	43.00 to 44.00

Cleveland

No. 1 hvy. melting	$43.50 to $44.50
No. 2 hvy. melting	40.50 to 41.50
No. 1 bundles	43.50 to 44.50
No. 2 bundles	38.50 to 39.50
No. 1 busheling	43.50 to 44.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. 2 ft and under	49.00 to 50.00
Drop forge flashings	42.00 to 43.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails 3 ft and under	60.00 to 61.00
Rails 18 in. and under	62.00 to 63.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	42.00 to 43.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	45.00 to 46.00
Malleable	50.00 to 51.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. plate	49.00 to 50.00

Buffalo

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bushelings	42.75 to 43.50
No. 1 bundles	42.75 to 43.75
No. 2 bundles	41.00 to 41.50
Machine shop turn.	32.00 to 32.50
Mixed bor. and turn.	36.00 to 36.50
Shoveling turnings	36.50 to 37.00
Cast iron borings	36.50 to 37.00
Low phos. plate	48.75 to 49.75
Scrap rails, random lgth.	47.75 to 48.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.75 to 51.75
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.75 to 51.75
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	42.50 to 43.00

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles, openhearth	40.00 to 41.00
No. 2 bundles	35.00 to 36.00
Heavy turnings	34.00 to 35.00
New busheling	39.00 to 40.00
Drop forge flashings	39.00 to 40.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Electric furnace bundles	42.00 to 43.00
Low phos. punch'gs, plate, heavy	46.00 to 46.50
Low phos. punch'gs, plate, light	42.00 to 43.00
No. 1 cupola cast.	.... 47.00
Heavy breakable cast.	.... 44.00
Stove plate	.... 42.00
Automotive cast.	.... 50.00

St. Louis

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	40.50 to 41.50
No. 2 bundled sheets	36.50 to 37.50
Machine shop turn.	27.00 to 28.00
Shoveling turnings	30.00 to 31.00
Rails, random lengths	51.00 to 52.00
Rails 18 in. and under	60.00 to 62.00
Locomotive tires, uncut	48.00 to 49.00
Angles and splice bars	52.00 to 53.00
Std. steel car axles	55.00 to 56.00
RR. spring steel	48.00 to 49.00
Cupola cast.	45.00 to 46.00
Hvy. breakable cast.	35.00 to 36.00
Cast iron brake shoes	41.00 to 42.00
Stove plate	39.00 to 40.00
Cast iron car wheels	47.00 to 48.00
Malleable	40.00 to 41.00
Unstripped motor blocks	33.00 to 34.00

New York

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 bundles	32.00 to 33.00
Low phos. 2 ft and less	.... 42.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	27.00 to 28.00
Clean cast chem. borings	32.00 to 33.00
No. 1 machinery cast.	45.00 to 46.00
Mixed yard cast.	.... 39.00
Charging box cast.	39.00 to 41.00
Heavy breakable cast.	39.00 to 41.00
Unstripped motor blocks	30.00 to 31.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	26.00 to 27.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Electric furnace bundles	39.00 to 40.00
Bar crops and plate	42.50 to 43.50
Structural and plate, 2 ft	41.50 to 42.50
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	40.00 to 41.00
Rerolling rails	46.00 to 47.00
Rails, 2 ft and under	46.00 to 47.00
Angles & splice bars	44.00 to 45.00
Std. steel axles	51.50 to 53.50
No. 1 cupola cast.	42.00 to 43.00
Stove plate	38.00 to 39.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	35.00 to 36.00
Heavy breakable	35.00 to 36.00
Unstripped motor blocks	35.00 to 36.00
Mashed tin cans	24.00 to 25.00

Boston

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	.... $34.17
No. 2 hvy. melting	.... 33.17
No. 1 bundles	.... 34.17
No. 2 bundles	.... 31.17
No. 1 busheling	.... 34.17
Machine shop turn.	$23.17 to 24.17
Mixed bor. and short turn.	23.17 to 24.17
Shoveling turnings	27.17 to 28.17
Clean cast chem. borings	.... 31.17
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Unstripped motor blocks	.... 28.25

Cincinnati

No. 1 hvy. melting	$44.50 to 45.50
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.50 to 45.50
No. 2 bundles	39.00 to 40.00
Machine shop turn.	31.00 to 32.00
Mixed bor. and turn.	31.00 to 32.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. 18 in. & under	49.00 to 50.00
Rails, random lengths	51.00 to 52.00
Rails, 18 in. and under	58.00 to 59.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	.... $30.00
No. 2 hvy. melting	.... 26.00
No. 1 bundles	.... 29.00
No. 2 bundles	.... 24.00
Machine shop turn.	.... 12.00
Cast iron borings	.... 16.00
No. 1 RR. hvy. melting	.... 37.00
No. 1 cupola cast.	.... 38.00

Los Angeles

No. 1 hvy. melting	.... $30.00
No. 2 hvy. melting	.... 24.00
No. 1 bundles	.... 29.00
No. 2 bundles	.... 24.00
Mach. shop turn.	.... 12.00
Shoveling turnings	.... 16.00
Cast iron borings	.... 16.00
Elec. fur. 1 ft and under	.... 33.00
No. 1 RR. hvy. melting	.... 37.00
No. 1 cupola cast.	.... 39.00

Seattle

No. 1 hvy. melting	.... $30.00
No. 2 hvy. melting	.... 26.00
No. 1 bundles	.... 29.00
No. 2 bundles	.... 24.00
No. 1 cupola cast.	.... 37.00
Mixed yard cast.	.... 36.00

Hamilton, Ont.

No. 1 hvy. melting	.... $35.50
No. 1 bundles	.... 35.50
No. 2 bundles	.... 35.00
Mechanical bundles	.... 33.50
Mixed steel scrap	.... 31.50
Bushelings	.... 30.50
Bush., new fact. prep'd.	.... 33.50
Bush., new fact. unprep'd.	.... 32.50
Short steel turnings	.... 32.50
Mixed bor. and turn.	.... 32.50
Rails, remelting	.... 35.50
Rails, rerolling	.... 44.50
Cast scrap	.... 50.00

cast iron wheels

for railroad wagons

Slightly more than two centuries ago, cast iron wheels were introduced for railroad wagon use. At first, only the forward axles were so equipped, in the belief that brakes would not hold on iron. But this theory was soon disproved—and cast iron was adopted for both rear and front wheels.

Now, on the country's rails and highways, wheels of iron or steel transport a vast tonnage of industrial and agricultural products—the vital needs for civilian and military use. To meet the ever-increasing demand for wheels, the supply of scrap must be constantly maintained.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M.S. KAPLAN COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Comparison of Prices

(Effective Mar. 31, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Mar. 31 1953	Mar. 24 1953	Mar. 3 1953	Apr. 1 1952
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and shapes: (per pound)				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	31.50†	31.50†	31.50†	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
Rails: (per 100 lb.)				
Heavy rails	$3.775	$3.775	$3.775	$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	$59.00	$59.00	$59.00	$56.00
Slabs, rerolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35

† Add 4.7 pct to base and extras.

Composite: (per pound)				
Finished steel base price	4.376¢	4.376¢	4.376¢	4.131¢

	Mar. 31 1953	Mar. 24 1953	Mar. 3 1953	Apr. 1 1952
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$60.69	$60.69	$60.69	$57.97
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	55.58
Foundry, Birmingham	51.38	51.38	51.38	48.88
Foundry, Chicago†	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.09
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago†	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Ferromanganese‡	226.25	226.25	226.25	186.25

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy pages.

Composite: (per gross ton)				
Pig iron	$55.26	$55.26	$55.26	$52.72
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.75	$44.75	$44.75	$43.00*
No. 1 steel, Phila. area	44.50	44.50	44.50	41.50*
No. 1 steel, Chicago	43.50	43.50	43.50	41.50*
No. 1 bundles, Detroit	40.50	40.50	40.50	41.15*
Low phos., Youngstown	49.50	49.50	48.50	46.50*
No. 1 mach'y cast, Pittsburgh	52.50	52.50	52.50	52.75
No. 1 mach'y cast, Philadel'a.	49.00	49.00	50.50	52.00*
No. 1 mach'y cast, Chicago	*46.00*	47.00	48.00	48.00

* Basing pt., less broker's fee. † Shipping pt., less broker's fee. Delivered prices, including broker's fee, unless otherwise noted.

Composite: (per gross ton)				
No. 1 heavy melting scrap	$44.25	$44.25	$44.25	$42.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.25	17.25	17.75	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.00‡	30.75‡	29.75‡	24.50
Copper, Lake, Conn.	32.125	32.125	....	24.625
Tin, Straits, New York	*$1.21*†	$1.21½	$1.21½	$1.21½
Zinc, East St. Louis	11.00	11.00	11.25	19.50
Lead, St. Louis	13.30	13.30	13.30	18.80
Aluminum, virgin ingot	20.50	20.50	20.50	19.00
Nickel, electrolytic	63.08	63.08	63.08	59.58
Magnesium, ingot	27.00	27.00	24.50	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	30.00

† Tentative. ‡ Average.

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

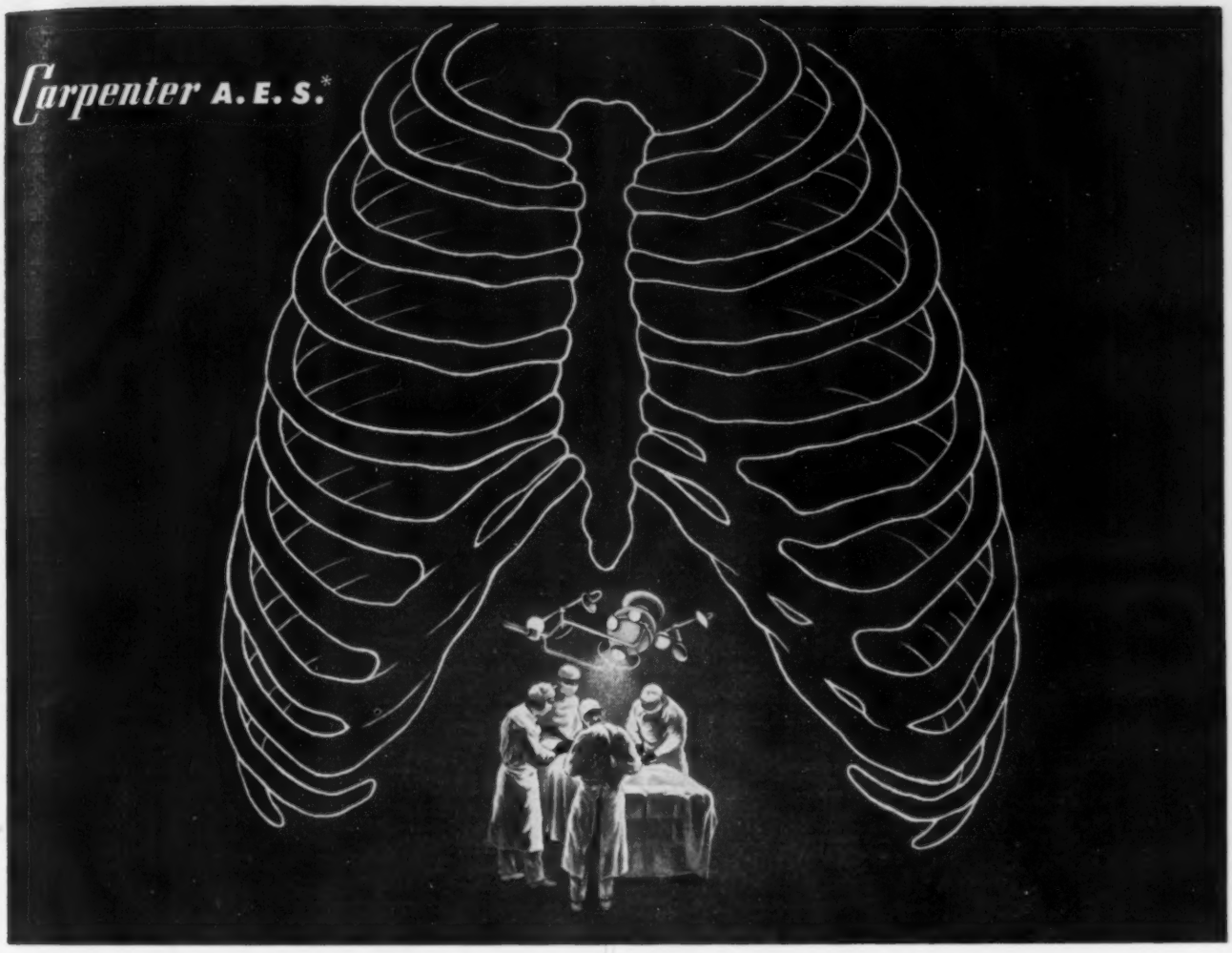
Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb, (2)6000 lb or over, (3)450 to 1499 lb, (4) 2000 to 3999 lb.

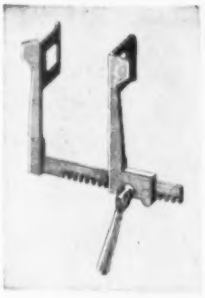
WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.81	7.17	8.04-8.32	6.42	.....	6.05	6.47	6.41	7.18-7.43	.....	.....	.....	.....
Birmingham	.15	5.80	6.65	7.70[1]	5.80	.....	6.10	5.95	5.80	7.85	.....	.....	.....	.....
Boston	.20	6.45-6.52	7.35-7.71	8.34-8.39	6.55	8.50[2]	6.75-6.80	6.56-6.75	6.42	7.46-7.54	10.85	11.15-11.17	12.85	13.15-13.18
Buffalo	.20	5.77-5.80	6.60-6.65	8.31	6.00-6.21	.....	6.30-6.40	6.08-6.15	5.78-5.80	6.95	10.70	11.00-11.07	12.70	13.00-13.07
Chicago	.20	5.80-5.81	6.65	7.90	5.83-5.84	.....	5.95-6.00	5.95	5.83	6.56-6.80	.....	10.65	.....	12.65
Cincinnati	.15	6.13	6.72	8.21	6.14	.....	6.47	6.42	6.13	7.16	.....	11.07	.....	13.07
Cleveland	.20	5.80-5.81	6.65	8.04	6.00-6.01	.....	6.12-6.17	6.28	5.89	6.66-6.90	.....	10.79	.....	12.79
Denver	.....	7.17-7.39	8.23	9.60	7.43-7.69	8.90	7.37-7.54	7.50-7.80	7.61-7.71	8.24-8.48	.....	.....	.....	.....
Detroit	.20	5.99-6.00	6.81-6.90	8.59	6.13-6.34	7.29-7.85	6.45-6.47	6.42-6.69	6.12-6.47	7.10-7.23	10.72	.....	12.72	12.42-12.92
Houston	.20	6.35-6.74	7.00-7.78	8.67-8.70	6.70-6.95	.....	6.60-6.85	6.60-6.82	6.75-7.00	9.00-9.35	11.90	11.35-11.90	13.60	13.90
Kansas City	.20	6.47	7.31	8.62	6.51	.....	6.62-6.67	6.62	6.50	7.57	.....	11.32	.....	.....
Los Angeles	.20	6.60	8.45	9.50	6.70	9.15	6.70	6.60-6.65	6.60	8.35-8.65	.....	12.05	.....	14.60
Memphis	.10	6.56	7.40	.....	6.98	.....	6.71	6.71	6.59	7.77	.....	.....	.....	.....
Milwaukee	.20	5.97-6.16	6.82	8.07	6.00-6.20	.....	6.12-6.36	6.12-6.31	6.00-6.19	6.83-8.07	.....	10.82	.....	12.82
New Orleans	.15	6.28	7.12	.....	6.32	8.32	6.43	6.43	6.31	7.85	.....	.....	.....	.....
New York	.30	6.11-6.62	7.27-7.41	8.07-8.58	6.56-6.72	8.94	6.60-6.88	6.34-6.70	6.59-6.79	7.46-7.53	10.68-10.74	10.91-11.04	12.67-12.74	12.97-13.04
Norfolk	.20	6.75	.....	.....	7.30	.....	6.65	6.65	6.55	8.30	.....	.....	.....	.....
Philadelphia	.25	6.11	7.13	7.95-8.30	6.45-6.46	.....	6.24-6.28	6.17	6.42	7.45	.....	10.67-10.79	.....	12.79
Pittsburgh	.20	5.80-5.81	6.65	7.90	5.94-5.97	.....	5.95-6.00	5.95	5.83	6.66-6.90	.....	10.65	.....	12.65
Portland	.20	7.80	9.05	9.15-9.75	7.60	.....	7.30	7.30	7.35	9.40	.....	.....	.....	.....
Salt Lake City	.20	8.30	.....	10.90[3]	8.45	.....	7.85	8.00	8.40	9.35[4]	.....	.....	.....	.....
San Francisco	.15	6.90	8.20	9.50	6.75	9.25-9.70	6.75	6.50	6.65	8.40-8.70	.....	12.05	.....	14.60
Seattle	.20	7.16-7.36	8.24-8.84	9.20-9.50	7.20-7.45	.....	7.04-7.19	6.63-6.83	6.88-7.08	9.37-9.42	.....	11.70	.....	13.70
St. Louis	.20	6.10-6.11	6.94-6.95	8.20	6.14	8.27-8.39	6.35-6.40	6.35	6.13	6.96-7.21	10.65	10.95	12.65	12.95
St. Paul	.15	6.47	7.31-7.61	8.61	6.50	.....	6.61-6.66	6.61	6.49	7.32-7.57	.....	11.31	.....	.....



"Stretching" Human Ribs for Better Surgery



*Another example of how Carpenter *Application Engineering Service is working for industry*

Look down a long hospital corridor late at night. A soft light gleams over the operating room. Inside, skilled hands, working with modern instruments, are prolonging another life. And one of the instruments often in use is a rib spreader . . . employed to separate ribs in the human body during a chest operation. A vital part of the spreader is the rack that supports the two jaws. It must have strength to remain rigid when the patient breathes heavily under anaesthesia. Its finish must be bright, smooth, sanitary. Above all, it must be *available* to meet the needs of many hospitals.

The manufacturer first tried an ordinary Type 416 Stainless Steel to make the rack. But because of difficulties in machining, he couldn't produce the spreader fast enough to fill critical orders. Here is how Carpenter **A**pplication **E**ngineering **S**ervice paid off. Carpenter Stainless No. 5, Type 416 was recommended . . . a *free-machining* Stainless invented by Carpenter some years ago. With No. 5 the manufacturer upped production *25%* and obtained more uniform hardening qualities in heat treatment.

Here is just one more case wherein industry has found a way to make better products and hold down costs . . . with the help of Carpenter **A**pplication **E**ngineering **S**ervice. A.E.S. is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.

Carpenter STEEL — **Tool, Alloy and Stainless Steels**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

STEEL PRICES

(Effective Mar. 31, 1958)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PILING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$76.00 *B3*			3.90 *B3*	5.80 *B3*				
	Buffalo, N. Y.			$59.00 *B3*	$70.50 *B3, R3*	$76.00 *B3, R3*		4.675 *B3*	3.90 *B3*	5.80 *B3*	3.725 *B3, R3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.				$77.50 *A2*	$83.00 *A2*					4.125 *A2*		5.90 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$59.00 *B3*	$70.50 *B3*	$76.00 *B3*			3.90 *B3*	5.80 *B3*	3.725 *B3*			
	Newark, N. J.													
	New Haven, Conn.											5.60 *A5* 5.85 *D1*		
	Phoenixville, Pa.								4.95 *P2*					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.725 *B3*	5.10 *B3*	5.70 *B3*	7.90 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.45 *R4*		
MIDDLE WEST	Alton, Ill.										4.20 *L1*			
	Ashland, Ky.										3.725 *A7*			
	Canton-Massillon, Ohio				$70.50 *R3*	$76.00 *R3* $78.60 *T5*								
	Chicago, Sterling, Ill.			$59.00 *U1*	$70.50 *U1, R3, W8*	$76.00 *U1, R3, W8*		4.675 *U1*	3.85 *U1, W8*	5.80 *U1*	3.725 *A1, W8* 4.725 *N4*	5.35 *A1*		
	Cleveland, Ohio				$70.50 *R3*							5.10 *A5, J3*		7.45 *J3*
	Detroit, Mich.	$56.00 *R5*	$57.00 *R5*		$73.50 *R5*	$79.00 *R5*					4.025 *G3* 4.40 *M2*	5.30 *G3* 5.45 *M2* 5.60 *D1* 6.05 *D2*	6.30 *G3*	8.15 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$59.00 *U1*	$70.50 *U1*	$76.00 *U1, Y1*		4.675 *I3*	3.85 *I3, U1*	5.80 *I3, U1* 6.30 *Y1*	3.725 *I3, U1, Y1*	5.35 *I3*	5.65 *I3, U1* 6.15 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.70 *T4* 5.80 *S1*	5.65 *S1*	7.30 *S1*
	Pittsburgh, Pa. Midland, Pa.	$54.00 *U1*	$57.00 *U1, C11*	$59.00 *U1*	$70.50 *U1*	$76.00 *U1, C11*	3.55 *U1* 3.65 *J3*	4.675 *U1*	3.85 *U1, J3*	5.80 *U1, J3*	3.725 *A7* 3.975 *A3* 4.225 *S7, S9*	5.10 *J3, A7* 5.45 *A3* 5.80 *B4, S7*	7.45 *J3*	
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								4.10 *W3*		3.825 *W3*	5.10 *W3*	6.10 *W3*	7.95 *W3*
	Youngstown, Ohio					$76.00 *Y1, C10*	3.55 *U1, R3*			6.30 *Y1*	3.725 *U1, Y1, R3*	5.10 *R3, Y1* 5.70 *C5* 5.80 *B4*	5.65 *R3, U1* 6.15 *Y1*	7.30 *R3* 7.80 *Y1*
WEST	Fontana, Cal.	$81.00 *K1*	$83.00 *K1*	$78.00 *K1*	$89.50 *K1*	$95.00 *K1*			4.50 *K1*	6.45 *K1*	5.175 *K1*	6.75 *K1*	6.55 *K1*	
	Geneva, Utah				$70.50 *C7*				3.85 *C7*	5.80 *C7*				
	Kansas City, Mo.								4.45 *S2*		4.325 *S2*			
	Los Angeles, Torrance, Cal.				$89.50 *B2*	$96.00 *B2*			4.45 *C7, B2*	6.35 *B2*	4.475 *C7, B2*	7.15 *C1*	6.40 *B2*	
	Minnequa, Colo.								4.30 *C6*		4.775 *C6*			
	San Francisco, Niles, Pittsburg, Cal.				$89.50 *B2*				4.40 *B2* 4.56 *P9*	6.30 *B2*	4.475 *C7, B2*		6.40 *B2*	
	Seattle, Wash.				$89.50 *B2*				4.50 *B2*	6.40 *B2*	4.725 *B2*		6.65 *B2*	
SOUTH	Atlanta, Ga.										4.275 *A8*			
	Fairfield, Ala. Alabama City, Ala.			$59.00 *T2*	70.50 *T2*				3.85 *T2, R3*	5.80 *T2*	3.725 *T2, R3*		5.65 *T2*	
	Houston, Texas		$65.00 *S2*		$78.50 *S2*	$84.00 *S2*			4.25 *S2*		4.125 *S2*			

STEEL PRICES

(Effective Mar. 31, 1953)

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SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.	
													Bethlehem, Pa.
4.775 *B3*	4.575 *B3*				5.675 *B3*	6.925 *B3*							Buffalo, N. Y.
										† Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Clayment, Del.
													Coatesville, Pa.
4.175 *A2*					5.925 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.325 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
4.775 *B3*	4.575 *B3*	5.075 *B3*			5.675 *B3*	6.925 *B3*	7.775 *B3*		4.425 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.625 *A5*				Worcester, Mass.
									4.425 *R4*				Trenton, N. J.
									4.70 *L1*				Alton, Ill.
4.775 *A7*		5.075 *A7*	4.925 *A7*										Ashland, Ky.
		5.075 *R3*											Canton-Massillon, Ohio
4.775 *W8*					5.675 *U1*				4.325 *A5, N4, R3*				Chicago, Sterling, Ill.
4.775 *R3, J3*	4.575 *R3, J3*		4.925 *R3*		5.675 *R3, J3*	6.925 *R3, J3*			4.325 *A5*				Cleveland, Ohio
4.975 *G3*	4.775 *G3*				6.225 *G3*	7.475 *G3*							Detroit, Mich.
													Duluth, Minn.
4.775 *I3, U1, Y1*	4.575 *I3, U1, Y1*	5.075 *I3, U1*	4.925 *U1*	5.475 *U1*	5.675 *I3, U1* 6.175 *Y1*	6.925 *I3, U1* 7.425 *Y1*				$8.70 *U1, I3, Y1*	$7.40 *U1, I3*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
4.30 *G2*	5.275 *G2*	5.50 *G2*	5.625 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.475 *C9*											Kokomo, Ind.
	4.575 *A7*		4.925 *A7*	5.475 *A7*									Middletown, Ohio
4.175 *S1*					5.675 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
4.775 *U1, J3, A7* 4.925 *A3*	4.575 *U1, J3, A7*	5.075 *U1*	4.925 *U1*		5.675 *U1, J3*	6.925 *U1, J3*	7.625 *U1*		4.325 *A5* 4.525 *P6*	$8.70 *U1, J3*	$7.40 *U1, J3*	6.10 *U1*	Pittsburgh, Pa. Midland, Pa.
									4.525 *P7*				Portsmouth, Ohio
4.775 *W3, W5*	4.575 *W3, W5*	5.075 *W3, W5*		5.475 *W3, W5*	6.025 *W3*	7.275 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.35 *W5*	Weirton, Wheeling, Follansbee, W. Va.
4.775 *U1, R3, Y1*	4.575 *R3, Y1*	5.775 *R1*	4.925 *Y1*	6.05 *E2*	5.675 *R3, U1* 6.175 *Y1*	6.925 *R3* 7.425 *Y1*		5.65 *E2* 5.825 *R1*	4.325 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.825 *K1*	5.675 *K1*				6.775 *K1*	7.875 *K1*			5.125 *K1*				Fontana, Cal.
4.875 *C7*													Geneva, Utah
													Kansas City, Mo.
4.475 *C7*		5.825 *C7*						5.575 *C7*	5.125 *C7, B2*				Los Angeles, Torrance, Cal.
									4.575 *C6*				Minnequa, Colo.
4.475 *C7*	5.525 *C7*	5.825 *C7*							4.975 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
4.775 *T2, R3*	4.575 *T2*	5.075 *T2, R3*			5.675 *T2*			4.925 *R3*	4.325 *T2, R3*	$8.80 *T2*	$7.50 *T2*		Fairfield, Ala. Alabama City, Ala.
									4.725 *S2*				Houston, Tex.

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing (To Fabricators)	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				4.675 *B3*	6.00 *B3*	5.925 *B3*					
	Buffalo, N. Y.	3.95 *B3, R3*	3.95 *B3, R3*	4.975 *B5*	4.675 *B3, R3*	6.00 *B3, B5*	5.925 *B3*	3.90 *B3*			5.95 *B3*	
	Claymont, Del.							4.35 *C4*		5.35 *C4*		
	Coatesville, Pa.							4.35 *L4*		5.75 *L4*		
	Conshohocken, Pa.							4.35 *A2*	4.95 *A2*		6.20 *A2*	
	Harrisburg, Pa.							6.50 *C3*	6.50 *C3*			
	Hartford, Conn.			5.475 *R3*		6.45 *R3*						
	Johnstown, Pa.	3.95 *B3*	3.95 *B3*		4.675 *B3*		5.925 *B3*	3.90 *B3*		5.25 *B3*	5.95 *B3*	5.225 *B3*
	Newark, N. J.			5.375 *W10*		6.35 *W10*						
	New Haven, Conn.											
	Camden, N. J.			5.375 *P10*		6.35 *P10*						
	Putnam, Conn.			5.475 *W10*								
	Sparrows Pt., Md.		3.95 *B3*					3.90 *B3*		5.25 *B3*	5.95 *B3*	5.325 *B3*
	Worcester, Mass.					6.35 *A5*						5.525 *A5*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.45 *L1*
	Ashland, Ky.							3.90 *A7*				
	Canton-Massillon	3.95 *R3*		4.925 *R2, R3*	4.675 *R3* 4.72 *T5*	5.99 *T5* 6.00 R2, R3						
	Chicago, Sterling, Ill.	3.95 *U, W8, R3* 4.55 *N4*	3.95 *R3* 4.70 *N4*	4.925 *A5, B5 W8, W10*	4.675 *R3, U1, W8*	6.00 *B5, L2, R3, W8, W10* 6.05 *A5*		3.90 *U1*, W8	4.95 *U1*	5.25 *U1*	5.95 *U1*	5.225 *A3, N4, R3* 5.325 *K2* 5.475 *W7*
	Cleveland, Ohio	3.95 *R3*	3.95 *R3*	4.925 *A5, C13*		6.00 *C13* 6.05 *A5*	5.925 *R3*	3.90 *R3, J3*	4.95 *J3*		5.95 *R3, J3*	5.225 *A5, C13, R3*
	Detroit, Mich	4.10 *R5* 4.30 *G3*		5.075 *R5, P8* 5.175 *P3*	4.825 *R5* 5.025 *G3*	6.15 *R5, P8* 6.20 *P3*	6.675 *G3*	4.45 *G3*			6.90 *G3*	
	Duluth, Minn.											5.252 *A5*
	Gary, Ind. Harbor, Crawfordsville, Indiana	3.95 *I3, U1, Y1*	3.95 *I3, U1, Y1*	4.925 *L2, M5, R3*	4.675 *I3, U1, Y1*	6.90 *L2, M5, R3, R5*	5.925 *I3, U1*, 6.425 *Y1*	3.90 *I3, U1, Y1*	4.95 *I3*	5.25 *U1*	5.95 *I3, U1*, 6.45 *Y1*	5.325 *M4*
	Granite City, Ill.							4.60 *G2*				
	Kokomo, Ind.											5.325 *C9*
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							4.15 *S1*		5.70 *S1*	5.95 *S1*	
	Pittsburgh, Pa. Midland, Pa.	3.95 *U1, J3*	3.95 *U1, J3*	4.925 *A5, J3, W10, R3, C8*	4.675 *U1, C11*	6.00 *C8, C11, W10* 6.05 *A5*	5.925 *U1, J3*	3.90 *U1, J3*	4.95 *U1*	5.25 *U1*	5.95 *U1, J3*	5.225 *A5, J3* 5.475 *P6*
	Portsmouth, Ohio											5.625 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.10 *W3*						3.90 *W5* 4.20 *W3*				
	Youngstown, Ohio	3.95 *U1, Y1, R3*	3.95 *U1, Y1, R3*	4.925 *F2, Y1*	4.675 *U1, C10, Y1*	6.00 *C10, F2, Y1*	5.925 *U1* 6.425 *Y1*	3.90 *U1, Y1, R3*			5.95 *R3* 6.45 *Y1*	5.225 *Y1*
WEST	Fontana, Cal.	4.65 *K1*	4.65 *K1*		5.725 *K1*		6.975 *K1*	4.55 *K1*		6.20 *K1*	6.65 *K1*	
	Geneva, Utah							3.90 *C7*			5.95 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.275 *S2*							5.825 *S1*
	Los Angeles, Torrance, Cal.	4.65 *C7, B2*	4.65 *C7, B2*	6.375 *R3*	5.725 *B2*		6.625 *B2*					6.175 *C7, B1*
	Minnequa, Colo.	4.40 *C6*	4.75 *C6*					4.70 *C6*				5.475 *C6*
	San Francisco, Niles, Pittsburg, Cal.	4.65 *C7, P9* 4.70 *B2*	4.65 *C7, P9* 4.70 *B2*				6.675 *B2*					6.175 *C6, C7*
	Seattle, Wash.	4.70 *B2*	4.70 *B2*				6.675 *B2*	4.80 *B2*			6.85 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.475 *A8*
	Fairfield, Ala. Alabama City, Ala.	3.95 *T2, R3*	3.95 *T2, R3*				5.925 *T2*	3.90 *T2, R3*			5.95 *T2*	5.225 *T2, R3*
	Houston, Texas Ft. Worth, Texas	4.35 *S2*	4.35 *S2* 5.05 *T7*		5.075 *S2*			4.30 *S2*				5.625 *S2*

Steel Prices

(Effective Mar. 31, 1953)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.

R1 Reeves Stee & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co. Ft. Worth

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15½ ga.	Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col	Col		
Alabama City *R3*†	127	135	...	132	...	144	6.075	6.325
Aliquippa, Pa. *J3*	127	141	...	...	...	148	6.075	6.525
Atlanta *A8*	130	140	...	135	...	149	6.325	6.675
Bartonville *K2*	127	139	140	132	148	148	6.075	6.50
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago *N4*	127	136	...	132	145	145	6.075	6.375
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.075	6.225
Crawfordsville *M4*	127	138	...	132	...	147	6.175	6.475
Donora, Pa. *A5*	127	133	...	132	142	142	6.075	6.225
Duluth *A5*	127	133	...	132	142	142	6.075	6.225
Fairfield, Ala. *T2*	127	133	...	132	142	142	6.075	6.225
Galveston *D4*	135	...	...	...	...	...	...	...
Houston *S2*	135	147	...	...	...	156	6.475	6.925
Johnstn., Pa. *B3*	127	...	148	...	149	...	...	6.575
Joliet, Ill. *A5*	127	133	...	132	142	142	6.075	6.225
Kokomo, Ind. *C9*	...	...	142	...	...	...	6.175	6.425
Los Angeles *B2*	...	...	...	...	...	...	7.025	...
Kansas City *S2*	139	...	...	144	...	160	6.075	7.125
Minnequa *C6*	132	146	138	137	...	153	6.325	6.70
Moline, Ill. *R3*	...	...	136	...	...	...	...	...
Pittsburg, Cal. *C7*	146	156	...	156	162	162	7.025	7.175
Monessen *P6*	127	138	...	...	147	147	6.075	6.45
Portsmouth *P7*	132	...	...	...	...	...	6.47	...
Rankin, Pa. *A5*	127	133	...	...	142	142	6.075	6.225
So. Chicago *R3*†	127	135	140	132	...	144	6.075	6.325
S. San Fran. *C6*	...	...	...	153	...	167	7.025	7.40
Sparrows Pt. *B3*	129	...	...	134	151	...	...	6.675
Struthers, O. *Y1*‡	...	...	...	...	...	...	6.075	6.475
Torrance, Cal. *C7*	147	...	...	...	...	...	7.025	...
Worcester *A5*	133	...	...	...	...	...	6.375	6.525
Williamsport, Pa. *S10*	...	...	...	...	...	...	...	...

Cut Nails, carloads base $7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (*A2*) Wheeling, W. Va (*W5*) $7.80.

† Zinc extra not included on Galv. Merch. Wire.

‡ Struthers Galv. Merch. Wire based on 15¢ Zinc.

STAINLESS STEELS

Base price, cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	15.50	16.50	18.00	17.50	26.75	21.75	23.50	13.50	16.25	13.75
Slabs, billets, rerolling	19.75	21.75	23.75	22.75	34.75	28.25	30.75	17.50	21.50	17.75
Forg. discs, die blocks, rings	36.75	37.00	39.75	38.50	57.25	43.50	48.25	30.00	30.50	30.50
Billets, forging	28.25	28.50	30.75	29.75	44.75	33.75	37.75	23.00	23.50	23.50
Bars, wires, structurals	33.75	34.00	36.50	35.50	53.00	40.00	44.75	27.50	28.00	28.00
Plates	35.75	35.75	38.00	38.00	56.00-56.25	44.00	49.00	28.75	29.75	29.25
Sheets	44.25	44.50	46.50	46.50	61.50	53.00	58.00	39.00	39.50	41.50
Strip, hot-rolled	28.50	30.50	35.00	32.75	52.50	40.00	44.50	25.00	32.75	25.75
Strip, cold-rolled	36.50	39.75	43.50	41.75	63.50	52.00	56.50	32.75	39.50	33.25

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa. *W2* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7* Wallingford, Conn., *W1*

Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y. *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft. Wayne, *J4.*

Wires: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1);* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3.*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3,* Washington, Pa., *J2.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

Miscellaneous Prices

(Effective Mar. 31, 1953)

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½–3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25	.....	.....	.....	.....	.....	.....
Youngstown *R3*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	.....	.....	.....	.....	.....	.....
Fontana *K1*	19.5	+2.75	22.5	1.25	25.0	4.75	25.5	5.25	26.0	6.25	26.5	6.75	27.0	7.25	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Alton, Ill. *L1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25	.....	.....	.....	.....	.....	.....
Sharon *M3*	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	.....	27.0	.....	29.0	.....
Wheeling *W5*	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	.....	.....	.....	.....	.....	.....
Wheatland *W4*	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	32.5	10.25	35.5	14.26	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Indiana Harbor *Y1*	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25	.....	.....	.....	.....	.....	.....
Lorain *N2*	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. *B3*	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5	.....	.....	.....	.....	.....	.....
Youngstown *R3*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	.....	.....	.....	.....	.....	.....
Fontana *K1*	19.25	.....	23.25	.....	25.25	.....	25.75	.....	26.25	.....	26.75	.....	27.25	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Alton, Ill. *L1*	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5	.....	.....	.....	.....	.....	.....
Sharon *M3*	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	.....	27.75	.....	31.25	.....
Wheeling *W5*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	.....	.....	.....	.....	.....	.....
Wheatland *W4*	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor *Y1*	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5	.....	.....	.....	.....	.....	.....
Lorain *N2*	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3¾ pts. higher discount. Buttweld jobbers' discount, 5 pct. St. Louis zinc price now 11.0¢.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	22.50
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beach Bottom *W5*	.....	7.85	9.10	9.90	10.45	11.00	11.70
Brackenridge *A3*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City *G2*	.....	8.55	9.80	.....	.....	.....	.....
Ind. Harbor *I3*	7.35	7.85	9.10	.....	.....	.....	.....
Mansfield *E2*	7.35	7.85	9.10	9.90	.....	.....	.....
Niles, O. *N3*	7.35	7.85	.....	.....	.....	.....	.....
Vandergrift *U1*	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. *R3*	7.35	7.85	9.10	.....	.....	.....	.....
Zanesville *A7*	7.35	7.85	9.10	9.90	10.45	11.00	11.70

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$110.30 to $113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24-in., Birmingham	96.50 to 101.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$128.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in pipe is $5 a ton above 6-in.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	23.93	28.14	23.19	27.28
	2½	12	32.17	37.83	31.19	36.67
	2	12	35.78	42.11	34.69	40.82
	3½	11	44.72	52.65	43.36	51.06
	4	10	55.52	65.31	63.83	63.32
National Tube	2	13	22.81	27.94	22.23	.....
	2½	12	31.28	38.31	30.51	.....
	3	12	35.87	43.93	34.98	.....
	3½	11	42.56	52.12	.....	.....
	4	10	54.02	66.16	.....	.....
Pittsburgh Steel	2	13	.....	28.58	.....	.....
	2½	12	32.16	39.19	.....	.....
	3	12	36.87	44.93	.....	.....
	3½	11	43.76	53.32	.....	.....
	4	10	.....	67.68	.....	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem *B3*	56.50	57.00	57.50	58.00	.....	.....
Birmingham *R3*	50.88	51.38	.....	.....	.....	.....
Birmingham *W9*	50.88	51.38	.....	.....	.....	.....
Birmingham *S5*	50.88	51.38	.....	.....	.....	.....
Buffalo *R3*	54.50	55.00	55.50	.....	.....	.....
Buffalo *H1*	54.50	55.00	55.50	.....	.....	66.75
Buffalo *W6*	54.50	55.00	55.50	.....	.....	.....
Chicago *I4*	54.50	55.00	55.00	55.50	.....	.....
Cleveland *A5*	54.50	55.00	55.00	55.50	59.50	.....
Cleveland *R3*	54.50	55.00	55.00	.....	.....	.....
Daingerfield, Tex. *L3*	50.50	51.00	51.00	.....	.....	.....
Duluth *I4*	54.50	55.00	55.00	55.50	.....	.....
Erie *I4*	54.50	55.00	55.00	55.50	.....	.....
Everett, Mass. *M6*	.....	59.50	60.00	.....	.....	.....
Fontana *K1*	60.50	61.00	.....	.....	.....	.....
Geneva, Utah *C7*	54.50	55.00	.....	.....	.....	.....
Granite City, Ill. *K3*	56.40	56.90	57.40	.....	.....	.....
Hubbard, Ohio *Y1*	54.50	55.00	55.00	.....	.....	.....
Jackson, Ohio *J1,G1*	.....	.....	.....	.....	.....	65.50
Minnequa *C6*	56.50	57.50	57.50	.....	.....	.....
Monessen *P6*	56.50	.....	.....	.....	.....	.....
Neville Island *P4*	54.50	55.00	55.00	55.50	.....	.....
Pittsburgh *U1*	54.50	.....	.....	55.50	.....	.....
Sharpsville *S3*	54.50	55.00	55.00	55.50	.....	.....
Steelton *B3*	56.50	57.00	57.50	58.00	62.50	.....
Swedeland *A2*	58.50	59.00	59.50	60.00	.....	.....
Toledo *I4*	54.50	55.00	55.00	55.50	.....	.....
Troy, N. Y. *R3*	56.50	57.00	57.50	.....	62.50	.....
Youngstown *Y1*	54.50	55.00	55.00	55.50	.....	.....
N. Tonawanda, N. Y. *T1*	.....	55.00	55.50	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7*	5.80	7.65	8.25	10.20	12.50
Carnegie, Pa. *S9*	.....	7.65	8.25	10.20	12.50
Cleveland *A5*	5.10	7.30	8.25	10.20	12.50
Detroit *D1*	6.45	7.50	8.10	.....	.....
New Castle, Pa. *B4*	5.80	7.65	8.25	10.20	.....
New Haven, Conn. *D1*	6.70	7.60	8.20	.....	.....
Sharon, Pa. *S1*	5.80	7.65	8.25	10.20	12.50
Trenton, N. J. *R4*	.....	7.95	8.55	10.50	12.80
Warren, Ohio *T4*	6.20	7.65	8.25	10.20	12.50
Weirton, W. Va. *W3*	5.80	7.65	8.25	10.20	12.50
Worcester, Mass. *A5*	5.40	7.60	8.55	10.50	12.80
Youngstown *C5*	.....	7.65	8.25	10.20	12.50

* Sold on Pittsburgh base.

(Effective Mar. 31, 1953)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *Ul*	3.775	4.25	4.925				
Chicago *R3*				6.65			
Cleveland *R3*							
Ensley *T2*	3.775	4.25					
Fairfield *T2*		4.25		6.65		4.775	
Gary *Ul*	3.775	4.25				4.775	
Ind. Harbor *I3*	3.775		4.925	6.65		4.775	
Johnstown *B3*		4.25					
Joliet *Ul*		4.25	4.925				
Kansas City *S2*							
Lackawanna *B3*	3.775	4.25	4.925			4.775	
Lebanon *B3*				6.65			
Minnequa *C6*	3.775	4.75	4.925	6.65		4.775	9.85
Pittsburgh *R3*							
Pittsburgh *O1*							
Pittsburgh *P5*							
Pittsburgh *J3*				6.65			
Pitt'g, Cal. *C7*						4.925	
Seattle *B2*				7.15		4.925	
Steelton *B3*	3.775		4.925			4.775	
Struthers *Y1*				6.65			
Torrance *C7*						4.925	
Youngstown *R3*				6.65			

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	31.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*29.50	
Conshohocken, Pa. *A2*		*27.50
New Castle, Ind. *I2*	*29.77	*26.24
Nickel carbon		
10 pct Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct Coatesville, Pa. *L4*	33.5	
No. 302 Stainless copper stainless. Carnegie, Pa. *A6*		77.00
Aluminized steel sheets, hot dip, Butler, Pa., *A7*		7 75

* Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in In.	Length in in.	Cents Per lb.
	GRAPHITE	
24	84	18.70
17, 18, 20	60, 72	18.70
8 to 16	48, 60, 72	18.70
7	48, 60	20.50
6	48, 60	21.95
4, 5	40	22.53
3	40	23.68
2½	24, 30	24.26
2	24, 30	26.57
	CARBON	
40	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	9.02
10, 12	60	9.30
8	60	9.58

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

70% or more $43.00
60% or less 40.00

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	8½	23	2	17½

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	29½
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
		Light		
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 48—10
Packaged, plain finish ..... 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Inc. Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $7.85

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	43
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	..

REFRACTORIES

Fire Clay Brick *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.25) ..$99.30
No. 1 Ohio 92.40
Sec. quality, Pa., Md., Ky., Mo., Ill. 92.40
No. 2 Ohio 83.15
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.60) 14.40

Silica Brick

Mt. Union, Pa., Ensley, Ala. $99.30
Childs, Pa. 103.95
Hays, Pa. 105.10
Chicago District 122.40
Western Utah 116.55
California 122.85
Super Duty, Hays, Pa., Athens, Tex., Chicago 116.65
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 17.30
Silica cement, net ton, bulk, Hays, Pa. 19.60
Silica cement, net ton, bulk, Ensley, Ala. 18.45
Silica cement, net ton, bulk, Chicago District 18.45
Silica cement, net ton, bulk, Utah and Calif. 25.95

Chrome Brick *Per net ton*

Standard chemically bonded Balt., Chester $86.00
Burned, Balt., Chester 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., in bulk 38.00
in sacks 43.70

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.

	Gross Ton
Openhearth lump	$10.95
Old range, bessemer	10.10
Old range, nonbessemer	9.95
Mesabi, bessemer	9.85
Mesabi, nonbessemer	9.70
High phosphorus	9.70

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags .... 10.9¢
Canadian sponge iron, del'd. in East ..... 12.0¢
Domestic sponge iron, 98+% Fe, carload lots .....15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe 53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe. 83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots .....30.00¢ to 33.25¢
Copper, electrolytic 10.75¢ plus metal value
Copper reduced .10.00¢ plus metal value
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd $3.50
Lead .....7.5¢ to 12.0¢ plus metal value
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 88.0¢
Nickel, annealed ..... 95.0¢
Nickel, spherical, unannealed 92.0¢
Silicon ..... 38.5¢
Solder powder 7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 83.0¢
Stainless steel, 316 ..... $1.10
Tin .....14.04¢ plus metal value
Tungsten, 99% (65 mesh) .. $6.00
Zinc, 10 ton lots .....23.0¢ to 30.5¢

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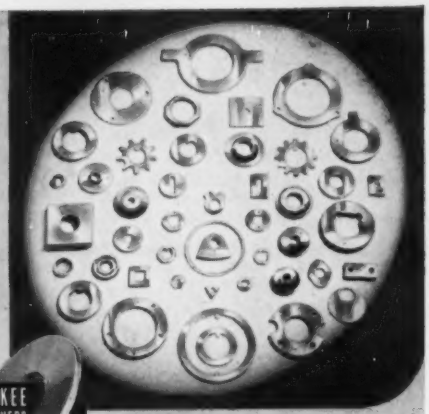

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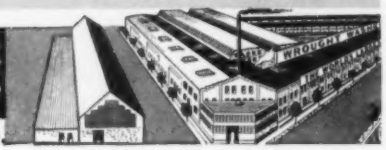

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Ferroalloy Prices

(Effective Mar. 31, 1953)

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.36% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65.69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$225
F.o.b. Johnstown, Pa.	227
F.o.b. Sheridan, Pa.	225
F.o.b. Etna, Clairton, Pa.	225
F.o.b. Philo, Ohio	225

Add $2.80 for each 1% above 82% Mn, subtract $2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	12.45
Ton lots, packed	14.00

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•

Ferroalloy Prices

(Effective Mar. 31, 1953)

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$84.00	$85.00
Pgh. or Chicago	84.00	85.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30	31.50
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.055 per ton for each additional 0.50% Si up to and including 17%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

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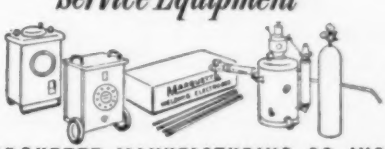

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Producers of fine tool steels—High Speed Steels Die Steels—Hot Work and Shock Resisting Steels Carbon Tool Steels.

TOOL COLUMBIA STEELS

Ferroalloy Prices

(Effective Mar. 31, 1953)

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carloads 9.90
- Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.
- Ton lots $4.90
- Less ton lots 4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti.. ... $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $4.95

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk lump ..... 14.50¢
- Ton lots, bulk lump ..... 15.75¢
- Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3-4%, Si, 40-45%, per lb contained B.. . $5.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound.... 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
- 10 to 14% B ..... .85
- 14 to 16% B 1.20
- 19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... $1.00
- No. 6 ..... 68¢
- No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
- Ton lots $1.46
- Less ton lots 1.57

Nickel - Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered
- Less ton lots $1.30

Silcax, contract basis, delivered.
- Ton lots ..... 45.00¢

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10-H.P. line—wet cutting, rt. angle or bevel. Capacity: 2½" solids; 3" x ⅜" angles; 4½" tubing; ¾" x 3" flats. Write for literature. Specify shape, size and material to be cut.

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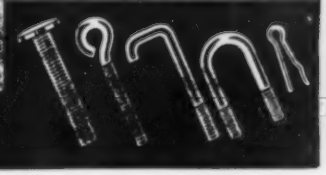

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AUTOMATIC, 20"x25" Fay (1942)
AUTOMATIC, 8" Bullard Mult-Au-Matic, 6-spindle
AUTOMATIC, 6-spindle Baird chucker
AUTOMATIC, 3¼" x 3¾" Cleveland "A"
AUTOMATIC, 1¼" Conomatic 8 spdl.
AUTOMATIC, 2¼" & 3½" Conomatic 4 spdl.
BORING MILL, 4" Detrick & Harvey, horiz. floor type
BRAKE, 8' Cincinnati, 65 ton, press
BROACH, No. 1 Foote Burt duplex surface
BROACH, 12 ton No. V2 American Vertical
BROACH, 15 ton H1048 American horizontal, 1946
BROACH, 15 ton 36" stroke Colonial vertical surface
BROACH, No. 3XA Oilgear horizontal hydraulic
BROACH, V42 American hydraulic, 18 ton
BULLDOZER, No. 22 Williams & White
COMPARATOR, 20" Portman Optical
DRILL, Nos. 217, 321 Baker
DRILL, No. 36 HO Baker hydraulic
DRILL, 21" & 24" Cincinnati, upright
DRILL, 12-spindle No. 12 Natco
DRILL, 12-spindle No. 10 Defiance rail type
DRILL, No. B 250 H Natco multiple
DRILL, 36-spindle Bausch, adjustable spindle
DRILL, RADIAL, 3½', 8" American sensitive
GEAR HOBBER, 72" Westinghouse
GEAR HOBBER, No. 12H G&E
GEAR HOBBER, No. 130 Cleveland Rigidhobber
GEAR HOBBER, No. 3 Adams Farwell
GEAR HOBBERS, No. 12 Barber Colman
GEAR HOBBERS, type A. Barber Colman
GEAR HOBBERS, Nos. 1 and 25 5A Lees Bradner
GEAR SHAVER, 12" Red Ring, 1946
GEAR TESTER, No. 13 Gleason
GRINDERS, CENTERLESS, Two No. 2 Cincinnati
GRINDERS, 10"x36" Norton Semi-Auto
GRINDER, DISC, 30", No. 8 Badger
GRINDER, DISC, No. 120 Gardner opposed, 1946
GRINDER, DISC, No. 228 Hanchett opposed, 1946
GRINDER, GEAR, 10" Pratt & Whitney
GRINDER, Internal, Bryant Nos. 5, 16A, 16-28 & 24-36
GRINDERS, INTERNAL, Nos. 72A3 and 72A5 Heald
GRINDER, SURFACE, No. 78 Wilmarth & Morman
HAMMER, Nos. 5N & 6B Nazel pneumatic
HAMMER, 40 lb. Bradley helve
HONE, Nos. 172 & 2610 Barnes hydraulic
LATHE, ENGINE, 24"x14', 13' and 12' American
LATHE, TURRET, No. 5W Acme universal
LATHE, TURRET, No. 6 W&S, G. H. motor-in-base
LATHE, TURRET, 36" Rogers vertical
LATHE, TURRET, 36" Bullard New Era
MILLER, 18" Cincinnati automatic
MILLER, 24" Cincinnati automatic duplex
MILLER, type 45 Product-O-Matic
MILLER, 30½" x 21" x 12" Ingersoll 4-spindle planer type
MILLER, 48" x 20" x 20' Ingersoll planer type 3 vertical heads
MILLER, 48" x 36" x 12' Ingersoll planer type adj. rail
MILLER, 84" Ingersoll 6-spindle rotary continuous
MILLER, PLAIN, No. 3B Milwaukee and No. 3 Le Blond
MILLER, THREAD, Type C Hall planetary
MILLER, THREAD, Nos. 4, 6 and CT 36 Lees Bradner
MILLER, VERTICAL, No. 1 Milwaukee, Timken
NIBBLER, No. 3 Savage rotary
PLANER, 36"x36"x12' Niles Bement Pond
PRESS, No. 61 Cleveland OBI
PRESSES, Nos. 56 & 56½ Toledo
PRESS No. 94½E Toledo, dbl. cr., s.s.
PRESS, No. 245½ Hamilton s.s. tiered frame
PRESS, No. EG54 Ferracute knuckle joint, 400 ton
PRESS, 600 ton No. 570 Toledo forging
PRESS, No. DA8411 Hamilton double action toggle
PRESS, 100 ton HPM hydraulic
PRESS, 500 ton Wat. Stillman Hydr.
RIVETERS, large variety
ROLL, 20'x3/16" Farnham bending
SLOTTER, 16" Bement Miles crank
SAW, 816S Kalamazoo metal cutting band, new
SAW, 7" No. 14 Higley cold-cutting
SHAPER, 24" American auto. oiled
SHAPER, 27" Morton draw cut
SHEAR, 38" throat No. 17F New Duty
TAPPERS, Two No. 71 Ettco
TESTER, 230,000 inch-pound Tinius-Olsen No. 2 torsion
TESTER, 100,000 lb. Riehle tensile & compression
THREADERS, 2" Landis pipe threading and cutting
THREADERS, Two ¾" Landis, double spindle
THREADERS, 2" Oster rotary head
WELDER, 100 KVA Thompson automatic spot

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NEWS OF USED AND REBUILT MACHINERY

Change Comment . . . Chicago used machine tool men, whose customary comment on market conditions is a laconic "lousy", are now reporting business is "okay" or "not bad."

Feeling that the market has improved is not unanimous, however. A small group of dealers report that, though sales were strong in February, activity dropped off in the last 2 weeks. An increase in cancellations of Ordnance vehicle contracts is said to be a factor in the sales decline.

Inventories Slip . . . While the downward movement of the used machine tool business appears to be leveling off in the Chicago area, dealers still have problems. A few are allowing inventories to fall again because they do not believe the current business level will hold throughout the year.

Others anticipate a price drop, despite recent hikes on a number of particularly sought-after types of machines. They believe the price decline will be felt at the dealer level before it reaches original sellers of used tools. As a result, these dealers are keeping their stocks down to avoid being caught with high cost inventories.

Are in Demand . . . Demand for heavy lathes and heavy milling machines still brings in distant inquiries, but the small lathe market is not strong. Shears, saws, punches and presses continue to be sought by small parts jobbers and other small plants. Grinders are also getting a good play.

Buying in the Chicago area was general and was not concentrated in any particular industries.

Expected Pickup . . . New Ordnance ammunition contracts led some dealers to expect a pickup in medium lathe sales, but no increase has materialized as yet. Some orders for heavy lathes appear to be the result of defense work, though the general level of direct defense sales is low.

Government aircraft and ordnance plants are the most active in this line, but demand from these sources is not heavy. Many dealers indicate their association with renegotiation forms is past history.

Was Not a Stimulant . . . Removal of Office of Price Stabilization ceilings has not stimulated sales noticeably around Chicago.

February was a good month for the used machinery trade and March was almost as good, but there has been no sudden rise since controls were lifted on Mar. 17. On many used tools, prices were below ceiling level before controls were scrapped.

Bloom Withers . . . While the flush is off foreign tools, a few new imports are appearing in Chicago showrooms, and several concerns say they will carry foreign equipment as regular stock.

Most dealers are not anxious to buy foreign tools, however, and won't carry them without specific requests. Several firms that have been stocking foreign machinery say they don't intend to place any orders in the future.

Accept Reservations . . . National Industrial Service Assn. is accepting reservations for its 20th annual convention in New York, May 24-28. Headquarters for the meeting will be the Hotel Statler.

Program has been set up to give out-of-towners ample time to tour New York on their own. In addition, many highly informative business sessions have been scheduled.

Registration fee is $20. Checks should be made out to: National Industrial Service Assn., N. Y. Convention Fund and sent to L. D. Kennedy, 303 Lexington Ave., New York 16, N. Y.